A THIRD DISSERTATION ON FEVER.

PART II.

CONTAINING AN

INQUIRY INTO THE EFFECTS

OF THE

REMEDIES,

WHICH HAVE BEEN EMPLOYED WITH A VIEW TO CARRY OFF

A

REGULAR CONTINUED FEVER,

WITHOUT LEAVING IT TO PURSUE ITS ORDINARY COURSE.

Medicina igitur adhuc taliter comparata est, ut fuerit magis ostenta, quam elaborata; etiam magis elaborata quam amplificata.

BACON AUG. Sc. Lib. ii. Cap. i.

Solent autem homines naturam tanquam ex præalta turri et e longo despicere, et circa generalia nimium occupari; quando si descendere placuerit et ad particularia accedere, resque ipsas attentius et diligentius inspicere, magis vera et utilis fieret comprehensio.—IBID.

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A

THIRD DISSERTATION, &c.

PART SECOND.

HAVING, in the firſt part of this diſſertation, pointed out the hiſtory of a regular continued fever, the accidents that take place in it, and the manner of avoiding theſe accidents, if it ſhould be left to purſue its ordinary courſe; excepting one accident, to wit, putrefaction, which ariſes but ſeldom; the author in the next place is to take into conſideration the remedies by which the fever may be carried off, ſo as to leave the patient in health in a ſhorter time, or to conduct him through with leſs danger, than if the fever had been left to purſue its ordinary courſe.

Since, as has been already obſerved, the eſſence of fever, or the ſtate in which the ſyſtem in fever differs from the healthy ſtate, is altogether unknown, the effects of medicines in removing that ſtate can only be known by obſervation or experiment; there being no remedy that has any property, either chemical or mechanical, or any operation, when given to a man in health, that can point out any ground for employing it to carry off this diſeaſe.

The author now, therefore, comes to ſhew what remedies have been employed by practitioners to carry off regular continued fevers, whether they have been employed in conſequence of ſome hypotheſis, or have been found out by mère accident.

The firſt remedy to be conſidered is opening a vein in the arm, or indiſcriminately in any other part of the body, and letting a quantity of blood flow out.

Authors and practitioners have confounded fever, ſuch as the author has defined,

fined it, with many other diſeaſes, particularly with all ſuch diſeaſes in which the pulſe is frequent to a certain degree.

Many diſeaſes, in which the pulſe is frequent to a certain degree, differ from one another in almoſt every other reſpect. The pulſe is frequent to upwards of an hundred ſtrokes in a minute in a pleuriſy; it is often frequent to above an hundred ſtrokes in a minute in gangrene and mortification; but pleuriſy, and gangrene, and mortification, are very different diſeaſes, and require treatments totally different from each other. In pleuriſy, taking away large quantities of blood is one of the moſt powerful remedies for carrying off the diſeaſe; in gangrene and mortification, taking away large quantities of blood would be the moſt effectual means of deſtroying the patient. In gangrene and mortification, the beſt mode of putting a ſtop to the diſeaſe, is to exhibit the bark of the cinchona, in large quantities, with wine and ſpices; in the pleuriſy, exhibiting large quantities of the bark of cinchona with wine and ſpices would be

the ſureſt way of increaſing the pleuriſy, and rendering it fatal.

Certainly, therefore, diſeaſes in which the pulſe is frequent may differ from each other in all things, excepting mere frequency of the pulſe, which Dr. Boerhaave makes a ſpecific mark of fever. It is to be obſerved, that he had not at the time he gave this definition ever ſeen a fever, having ſtudied theology, and not medicine.

It has already been ſhewn that the pulſe in fever is by no means always frequent, and that therefore frequency of the pulſe can by no means be conſidered as a pathognomonic ſymptom of fever.

If all diſeaſes, in which the pulſe is frequent, be confounded together, and called fever, it certainly cannot be ſaid that taking away blood never cures the diſeaſe; but if the diſeaſe, which the author has endeavoured to define as fever, be only meant, the taking blood from a large vein, in any part of the body indiſcriminately, never diminiſhed,

nifhed, fhortened, nor carried off a fever in any cafe he has feen, nor has he found any upon record in which it had this effect.

It is true that an accident, fuch as general inflammation, may happen in an irregular fever, which may deftroy the patient, which accident may be counteracted and prevented from doing mifchief by taking blood from the arm, or any other part indifcriminately, as will be defcribed when fuch irregularity is treated of. The accident being removed, the fever may afterwards continue its courfe, may terminate by a crifis, or wear itfelf out, juft in the fame manner as if no fuch accident had taken place.

The author having affirmed that taking away blood from the arm, or from any large vein, neither increafes nor diminifhes a fever, nor alters its courfe, as far as he has feen, he next comes to confider what might be expected from taking away a quantity of blood indifcriminately from any blood-veffel during a fever.

A quantity of blood flowing out of the body, whether it be taken on purpoſe, or by any accident, occaſions weakneſs. If the blood continues to flow, the weakneſs will encreaſe ſo as to render the body incapable of performing any function or action whatever, and in conſequence to kill. If it does not continue to flow, it weakens a man, and the weakneſs continues until the blood is reproduced by the digeſtion of food of proper nouriſhment, or perhaps by the converſion of expreſſed oil, or other ſubſtances depoſited in the body, into new blood. This weakneſs, with the accidents that ariſe from it, are the only effects of the loſs of blood, which are perceivable.

As fever takes place equally in a ſtrong and a weak man, it is alſo equally violent, as far as regards the fever itſelf, in a weak man as in a ſtrong man, and it is apter, or at leaſt as apt to run out to a great length in a weak man, as in a ſtrong man.

It is not, therefore, *a priori*, at all probable, that weakening a man ſhould diminiſh or ſhorten a fever.

It comes then to be enquired into, why taking away blood indiſcriminately from any large vein has been ſo often practiſed in fevers, even by practitioners of the firſt rank in medicine?

The author can only refer this practice to the impatience with which mankind bear any evil, and that ſuperſtition which predominates in them. If any violent diſeaſe takes place, men immediately recur to ſome violent remedy. Their recurring through impatience to ſome very violent remedy is no proof, that ſuch remedy is uſeful to give them relief from the malady. If a man who has gone upon a journey ſhould return, and without previous notice find his houſe burnt down, his whole family and property deſtroyed, and all his friends ruined, he would be apt to ſtamp upon the ground, beat his breaſt and tear his hair; but ſtamping upon the ground would not rebuild his houſe, nor would beating his breaſt reſtore his family and property, nor tearing his hair retrieve his friends. It is mere impatience that makes

him have recourſe to theſe violences, ſo mere impatience makes mankind have recourſe to violent remedies in diſeaſes, although no experience has ſhewn that they are of any uſe in the diſeaſe for which they have been employed. To this argument the author will have occaſion to recur, when he comes to treat of irregular intermittents in a future diſſertation.

So in like manner it is often from ſuperſtition that ſuch violent remedies, and eſpecially blood-letting, have been employed.

Mankind are exceedingly apt to believe, that refraining from ſome gratification is agreeable to the Almighty, or the gods their imaginations have created; even if they enjoy that gratification, without any injury to their own health or conſtitution, or without injury to their fellow creatures, or any animal whatever, or without hurt to their moral character.

Some pretended teachers of religion have even gone ſo far as to refuſe to their diſciples,

ples, dying of so distressing a disease as pulmonary consumption, the gratification of enjoying the cheerful warmth of the sunshine.

Under this, or some very similar idea, men have thought that their gods would be content with one part of the body to save the whole. Hence we see among many rude nations, that a finger or toe is cut off, or a tooth or two knocked out, in order that the rest of the body may be left safe.

Blood, by its intense red colour, has attracted the attention of mankind. It has also attracted their attention because the loss of it, as has already been said, in a certain quantity, is fatal; the losing, therefore, a quantity of blood, has become the object of their superstition. Losing blood has been looked upon as the greatest oblation that could be made in the most solemn ceremonies; as the mark of the greatest bond of secrecy and steadiness, men have signed contracts with their blood. Taking away, therefore, a quantity of blood has

been thought a ſacrifice the moſt powerful for carrying off a diſeaſe, and for carrying off fever as one of the moſt violent and fatal of diſeaſes.

The author does not mean to ſay that every practitioner, who bleeds conſtantly at the beginning of a regular continued fever, has this idea in his mind. The greateſt number of practitioners follow the practice of thoſe who went before them, without examining from whence that practice has ariſen, or upon what ground it is founded.

From this view of the ſubject it may, perhaps appear why blood-letting has come into practice in the beginning of all regular continued fevers.

Practitioners alſo have not compared caſes of fevers in which it has been practiſed, and of fevers treated otherwiſe in the ſame manner in which it has not been practiſed.

The author has ſaid, that taking away a quantity of blood from any large vein indiſcriminately,

diſcriminately, in any part of the body, neither increaſes, diminiſhes, nor ſhortens a regular continued fever. The next enquiry is, whether any miſchief may ariſe in a regular continued fever from taking away a quantity of blood.

The author has already ſhewn that a patient afflicted with regular continued fever cannot digeſt his ordinary quantity of food; therefore the fluids which are conſtantly waſting cannot be recruited, and that the ſyſtem muſt be weakened.

That in a regular continued fever there are conſtant exertions which likewiſe debilitate.

That the reſt which takes place in ſleep is neceſſary to reſtore the living power, but ſleep being prevented in fever it is not recruited.

That in conſequence of all theſe cauſes of weakneſs, the patient is actually ſo debilitated as to be deſtroyed in many inſtances.

ſtances. The further debility ariſing from emptying the veſſels by taking away a quantity of blood, is often ſuch as to deſtroy the patient in the remaining part of the diſeaſe. Patients in conſequence have very often been cut off, when blood has been taken indiſcriminately from any large vein at the beginning of the diſeaſe, as the author has ſeen in a great many caſes. In the firſt part of the author's practice, the Boerhaavian doctrine prevailed; this induced practitioners to take blood from the patient in all caſes of fever, ſo that the author has had occaſion frequently to ſee the effects of this practice.

The author having ſaid that the eſſence of the diſeaſe not being at all known, it cannot be ſaid, *a priori*, whether any particular remedy will be of uſe in ſhortening or entirely carrying off fever.

Taking away blood from the veſſels of the head has, in ſome caſes, immediately carried off fever; it has alſo tended to diminiſh delirium accompanied with fulneſs of

of the veſſels of the head, even when it does not ſhorten the diſeaſe.

The firſt of theſe effects will be conſidered in a diſſertation on the irregularities of fever, and the ſecond in a future part of this diſſertation.

Many practitioners have ſuppoſed that fever ariſes from ſome peculiar kind of matter that has got into the body; that fever is an effort produced in the body to induce ſome operation by which ſuch matter might be deſtroyed. Sydenham judiciouſly ſuppoſes, that a fermentation takes place which alters the qualities of the matter, or converts it into another ſpecies of matter which has not the property of producing or keeping up this diſeaſe.

If it were really true that any particular ſpecies of matter produced and kept up a fever, it would follow that until ſuch matter was deſtroyed by a fermentation, or ſome other proceſs that might take place in the body, or was evacuated, the fever would

continue.

continue. In that caſe, it would become a queſtion whether ſome other means than that which takes place in the body of itſelf, might be employed to take this matter out of the body, or deſtroy it, ſo that it might no longer keep up the diſeaſe.

Some practitioners have ſuppoſed that this might be done by evacuation.

If a blood-veſſel is opened, the whole circulating fluids are equally evacuated, every one, good or bad, noxious or innoxious, thoſe that are commonly in the body, and thoſe that are there only by accident; no particular matter would be taken out more than another, and therefore it is not to be ſuppoſed that the matter occaſioning a fever would be removed by making this evacuation.

If the ſubſtances evacuated out of the body by the various excretions be examined ſlightly, they appear to be more different than when they are examined more minutely, but ſtill upon minute examination they differ very much.

It might happen that ſome ſecretory organ is diſpoſed to throw ſome particular noxious matter out of the ſyſtem, and that therefore, by increaſing ſome ſecretion, (ſince an encreaſe of any ſecretion, to a certain degree, occaſions the ſecreted matter to be thrown out of the body) might make the matter producing and keeping up fever be evacuated, ſo that the fever ſhould ceaſe. But it may alſo happen on the other hand, as has already been taken notice of, that a fever may ariſe without any noxious matter being applied to any part of the body, or generated in the body; and in this caſe there being no noxious matter to evacuate, neither the operation of purgatives, or any other evacuant would carry off the matter, and ſo remove the diſeaſe.

It has alſo been ſhewn that noxious matter does ſometimes produce fever when applied to the body, and that after the fever is produced, it is really contained in the body, as in the caſe of fever ariſing from the application of variolous matter; but then it has been ſhewn, that in ſuch caſes the noxious

matter

matter produces the diſeaſe at once, and what is contained in the ſyſtem after the fever had taken place, has no effect upon the diſeaſe; it neither increaſes it, nor does its abſence diminiſh it, and the fever often goes off when there is the largeſt quantity of noxious matter in the body. In ſuch caſes it would not ſurely be conceived, if we could evacuate ſuch matter, that the diſeaſe would be carried off; in ſuch caſes, therefore purgatives would be of no uſe.

Hitherto the argument has been purſued *a priori*; but neither the eſſence of fever, nor the operations of the human body, are ſufficiently known, as the author has before obſerved, to determine the efficacy of any medicine to carry off fever; experience muſt therefore be had recourſe to, to determine whether purgatives or any other medicine producing evacuation from any gland may be employed to carry off the diſeaſe.

If the matter be referred to the experience of the moſt judicious authors, all thoſe who have conceived fever to depend upon matter

matter of a peculiar kind contained in the ſyſtem, have agreed that it muſt be concocted before it can be evacuated; that is, that it muſt undergo ſome proceſs before it is prepared for evacuation; otherwiſe that evacuation, by purging, or increaſed ſecretion from any of the glands, will have no effect in carrying off the diſeaſe. They are agreed at leaſt that evacuation before concoction muſt only be made at the beginning of the diſeaſe to be efficacious; after the diſeaſe has continued a day or two, they have no more expectation that evacuating the matter will carry off the diſeaſe. The author, therefore, would be warranted by authority to ſay, that evacuation by purging, or any other increaſed ſecretion from glands, would have no power of carrying off fever, excepting the evacuant ſhould be employed in the firſt twenty-four hours; or at the end of the diſeaſe, after the matter is concocted, or has undergone ſuch an alteration as to render it fit for evacuation.

It is further to be obſerved, that when any matter is applied to the body, ſo

as to produce fever, not immediately, but at the interval of feveral days, fuch as the matter of the fmall pox, or the meafles, or putrid or infectious vapour; if purgatives are employed during the interval between the application of fuch matter, and the taking place of the firft paroxyfm of fever, the fever has never been prevented from taking place in any cafe which the author has feen; or in any cafe which has been recorded with almoft any evidence. This is equally to be obferved in thofe cafes in which the application of the caufe has produced fome immediate appearance of the firft ftage of fever without producing a perfect paroxyfm; when thefe appearances have continued until a complete paroxyfm has taken place.

In thofe cafes where the application of the matter to the body, which occafioned the fever, produced no appearance of the difeafe on its application, but the patient felt himfelf in perfect health until the complete attack of the fever came on, neither purgatives nor any other medicine increafing fecretion, have prevented the difeafe.

If

If the evacuation by purging or increaſed ſecretion from any of the glands, does not carry off the matter from the body before it has produced the diſeaſe, there ſeems to be little reaſon to hope that ſuch evacuation will carry off the matter occaſioning the fever, and the fever itſelf after it has actually taken place.

The author has already obſerved, that feculent matters remaining in the inteſtines, which they are apt to do when a fever takes place, tend to increaſe the diſeaſe. Though their removal prevents the miſchief they would produce, yet, as far as the author has been enabled to judge from the attention he has paid to ſuch caſes, their evacuation has in no caſe done more than merely obviate the miſchief which would have taken place in conſequence of their retention. Such evacuation has never, in any degree, removed the fever, or prevented it from purſuing its ordinary courſe.

Thoſe practitioners who have believed that fever depends upon ſome noxious mat-

ter contained in the body; that that noxious matter is concocted; that is, goes through some operation by which it is prepared for evacuation, have also supposed that when a crisis took place, the matter was evacuated after it is concocted, and that so the fever was carried off. They have thought that if it was not completely evacuated, it is necessary to employ purgatives to evacuate what might remain of the matter in the body, and re-produce the disease. They have also thought that when no marked crisis took place in the disease, but it gradually subsided, that it subsided more slowly on account of the noxious matter not being all at once evacuated, and therefore have employed purgatives to make it be evacuated more speedily, so that the disease should sooner subside.

The author, from his own practice, is obliged to be of a contrary opinion, since he has seen relapses much more frequently take place when purgatives have been employed after a marked crisis, or after the disease has gradually subsided, than when purgatives have not been employed.

Upon

Upon the whole, then, the author believes it to be perfectly neceſſary at all times, during the progreſs of a regular continued fever, to keep the inteſtinal canal free of feculent matter; yet that making further evacuation by purging or increaſing the ſecretion from any of the glands, ſo as to occaſion evacuation, is of no uſe in carrying off the fever, but rather tends to prevent the fever from being carried off, and, if it is carried off, to produce relapſes.

Moreover the author has already ſhewn, that it required the whole force of the ſyſtem to ſupport the patient through the ordinary courſe of a regular continued fever. He has alſo ſhewn that the force of the ſyſtem is reduced by evacuation; he muſt therefore conclude, that ſimple evacuation by purging, excepting in as far as it is neceſſary to keep the *primæ viæ* clear of feculent matter, is detrimental inſtead of being uſeful; and that ſimple evacuation from any of the glands, as tending alſo to weaken, is detrimental inſtead of being uſeful.

It does not appear with any degree of certainty that antimony, a medicine which has been employed to carry off fever within this century or two, was at all known to the Greek philoſophers, phyſicians, or artiſts.

There was a ſubſtance which they named ſtibium, which was employed to give a blackneſs to the eyes, but the effects which were produced from it either among the Greeks and Romans, or among the modern inhabitants of Aſia, ſhew that this ſubſtance was more probably a kind of lead ore than an ore of antimony.

Antimony, or as it is more commonly called crude antimony, is the ore of a metal which exiſts in many parts of the earth. It is a compound of ſulphur and a metal, in which the ſulphur bears a much greater proportion to the metal than can be combined with it chemically. More properly, it is a compound of ſulphur and the metal, diffuſed through a ſuperfluous quantity of ſulphur, ſo that part of the ſulphur retains

ſome

ſome of its properties, which it has when not combined with the metal. The ſulphur ſo covers the metal or is ſo combined with it, as to prevent it from producing its medicinal effects. This ore of the metal is ſolid in the heat of the atmoſphere. It requires a little leſs than that degree of heat which renders ſubſtances luminous to melt it, ſomewhere probably between five and ſix hundred degrees of Fahrenheit's thermometer. Its melting point has not been exactly aſcertained in as far as the author knows. It is of a dark blue colour, and is generally found in a kind of cryſtalization, ſometimes in complete cryſtals, which are priſms terminated by pyramids at one end, and at the other generally attached to each other; otherwiſe is a maſs without form. More commonly theſe cryſtals are united together ſo as to form a ſtriated maſs, eſpecially when they are unmixed with any other ſubſtance.

The metal has lately been found alſo combined with ſome ſubſtance, ſo as to

form the ſame kind of cryſtals or ſtriated maſs, only of a dark red colour, ſhining, however, with metallic luſtre. It has been conjectured, rather than confirmed by experiment, that theſe cryſtals or this ſtriated ore contain arſenic, beſides ſulphur and the metal of antimony. This conjecture is rendered probable, becauſe this red ore of antimony has been almoſt always found with regulus of arſenic; that is, the metal of arſenic pure; and therefore experiments made to verify the exiſtence of arſenic in this red ore, ſhould be made in ſuch parts of it as are perfectly clear from the particles of the metal of the arſenic in which it is found.

The metal has alſo been found but very rarely, certainly however ſometimes uncombined with any other ſubſtance, but ſo rarely hitherto as not to be employed for any medicinal purpoſe.

Upon the whole, all the antimony which has been employed in medicine has been

procured from that ore of antimony, consisting of antimony and sulphur.

This ore, when dug from the mine, is laid upon an inclined plane, formed from a mixture of clay and sand burnt in the fire. The inclined plane is heated red hot; the ore of the antimony being laid upon it melts, and runs off from the other substances with which it is mixed, and is received into a large and deep earthen vessel, in which, when it has stood to cool, it concretes into a solid mass.

If this solid mass concretes so as when broken to exhibit long striated shining spiculæ, it is a pure compound of antimony and sulphur, and fit to be employed for medicinal purposes.

A vast number of chemical processes have been employed to give antimony medicinal effects; more than two or three thousand. Of the product of all these there are only three preparations at present much in use.

One

One is made by boiling the antimonial ore or crude antimony in a ſolution of pure or prepared kali in water. The decoction, after it has been ſtrained, is diluted with a conſiderable quantity of water, at leaſt ten times its weight. The diluted ſolution is placed in a ſhallow veſſel, the ſurface expoſed to the air, until a powder falls to the bottom of the veſſel, which, taken out and dried, is called kermes mineral.

The ſecond proceſs is performed by mixing the ore of antimony or crude antimony, finely powdered, with an equal weight of the ſhavings of the horn of any animal. This mixture is to be put into an iron pot, which is to be heated red hot, and the mixture is to be ſtirred, the pot being kept red hot, until it ceaſes to ſmoke. The mixture is afterwards to be allowed to ſtand until it cools. It is then to be put into a crucible, which is to be covered with another crucible, whoſe mouth is to be turned down into that crucible which contains the materials. The crucibles with the materials are expoſed to a white heat for two hours; part of the matter

ter remains of a white colour in the under crucible, which is to be ufed; part fublimes into the upper crucible, which is to be thrown away.

The third preparation is made by combining the metal of antimony with tartar, an acid produced in the fermentation of various wines, which is found adhering to the fides of the veffels in which the wine has ftood for a year or more after the active fermentation has ceafed.

When two fubftances, which unite with one another only in one proportion, are combined together chemically, and the compound purified, the fubftance is undoubtedly the fame in all its properties. It happens, neverthelefs, with refpect to the chemical combination of two fubftances which unite with each other in one proportion only, that when they are combined together by different proceffes, there are often different imperfections in the combination or fome want of purity in the compound. This, though not fenfible to any chemical

teſt, makes a very conſiderable difference in their actions as medicines. In the preſent inſtance of the compound of tartar and the metal of antimony, or, perhaps, if ſtrict adherence was to be had to chemical accuracy, we ſhould ſay compound of tartar and calx of antimony, this difference is conſpicuous. Of the ſeveral methods of forming this compound, the following is the beſt for medicinal purpoſes: Take an equal weight of the ore of antimony ſeparated from extraneous ſubſtances by fuſion, as has been above deſcribed, and of kali nitratum. Powder them together, and throw the mixture into a crucible, heated ſo as to be juſt luminous, by very ſmall portions, about twenty grains at a time, until a deflagration takes place; wait till the deflagration is over; throw in a little more of the mixture; wait again till the deflagration is over. Proceed in this manner until the whole is deflagrated. Cover the crucible, and expoſe it to an heat juſt ſufficient to melt the whole maſs. Pour the melted maſs into an iron veſſel of a conical form, the point of the cone being downwards; the

whole will be found, when it is cold and ſolid, divided into two ſubſtances, one of a reddiſh brown colour and heavier, which has fallen to the bottom; the other, of a grey colour, which is found at the top, and is ſpecifically lighter. The heavier part, which is found at the bottom, is a compound of ſulphur and the metallic part of the antimony. A portion of the ſulphur which was united with the antimony in its ore, more than was neceſſary to combine with the metal of the antimony, is converted into vitriolic acid by uniting with the air of the nitrous acid. This vitriolic acid is found in the upper greyiſh maſs, combined with the kali of the kali nitratum, and forms kali vitriolatum.

The antimonium ſulphuratum, found at the bottom, is to be powdered and mixed with one third more than its weight of purified tartar, and boiled in ſix times its weight of water for a quarter of an hour; the ſolution is to be filtrated and the water evaporated, and the compound of the tartar and the metal of the antimony cryſtallized.

This

This ſalt for chemical purpoſes may be purified, by diſſolving it again in water and re-cryſtallizing it; but it is a queſtion whether it would not loſe ſome portion of its medical powers by this purification.

The metal of the antimony may be ſeparated from the ſulphur with which it is found combined in its ore, by mixing the ore with five times its weight of kali preparatum; that is, with kali combined with gas, which gas has been called alſo fixed air and carbonic acid. The mixture of the kali preparatum and ore of the antimony is to be melted together by a heat juſt ſufficient to render them perfectly fluid. The crucible being taken from the fire is to be left till it is quite cold; on breaking it, the metal of the antimony will be found at the bottom, and the compound of kali and ſulphur at the top.

This is not the moſt economical mode of obtaining the metal of antimony; but provided we take the ore ſeparated from the other ſubſtances with which it is found mixed

mixed in the mine, as has above been defcribed, the metal by this procefs is obtained the pureft for medicinal purpofes.

If the metal thus obtained is powdered finely, and boiled with pure tartar in water, a compound of the tartar and antimony will be obtained, which, if purified by re-cryftallization, will be exactly the fame with that obtained by the procefs above defcribed, in all its chemical properties.

Another mode of obtaining this compound is—Take the ore of antimony purified, as has been already defcribed, powder it, and put the powder into a flat veffel; heat it till it begins to fmoke; keep up the heat, but take care not to render it fo great as to melt the mafs, until it no longer fmokes in any heat not fufficient to melt it. The remaining mafs, which is the metal of antimony calcined (probably combined with pure air) if expofed to a greater degree of heat, will melt into a glafs. If this glafs be powdered, and boiled with pure tartar in water, a compound of antimony and tartar will alfo be procured; this purified by repeated

peated ſolutions in water and cryſtallization will, in all its chemical properties, be the ſame as when the ſalt is procured by the two proceſſes already deſcribed, but if not cryſtallized a ſecond time, will not agree exactly in its medicinal effects.

The metal of antimony may be combined with muriatic acid, by ſeveral proceſſes. One of theſe, for inſtance, is. Mix the ore of antimony with that compound of muriatic acid and mercury which has been called corroſive ſublimate. Perform a diſtillation, or rather a ſublimation, and expoſe the matter ſublimed to the air of the atmoſphere, until it has attracted water enough to render it fluid; pour this ſolution of antinium muriatum in water, or any other made by this or any other proceſs in which the water is ſaturated with the antimonium muriatum, into eight or ten times its weight of diſtilled water. A calx of antimony will fall down in a white powder, which has been called powder of algorath; this being boiled with pure tartar in water will combine with it, and form antimonium tartariſatum, which,

which, if purified by re-cryſtallization, will be the ſame to all chemical and medical purpoſes as the antimonium tartariſatum produced by the three foregoing proceſſes, but not exactly in its medical effects unleſs purified by recryſtallization.

Although the antimonium tartariſatum obtained by any of theſe proceſſes, when purified by re-diſſolution in water and re-cryſtallization, may perhaps be the ſame for medicinal as well as chemical purpoſes, which however has not been proved by experiment, yet when it has only ſimply been formed by theſe four different proceſſes, without re-diſſolution in water and re-cryſtallization, there is a difference in its operations as a medicine.

When the London College of Phyſicians reviewed their pharmacopeia for its reformation and republication in the year 1786, it became a queſtion which of the four proceſſes they ſhould adopt.

Whenever any queſtion of a chemical or pharmaceutical kind occurred, it

was referred to a committee confifting of fome members of the College and the Company of Apothecaries, and the proceffes were actually performed in the laboratory of the Company of Apothecaries, that fo the beft mode of performing the operation might be verified by experiment.

A queftion having arifen with regard to tartarifed antimony, it was prepared by all thefe proceffes.

The tartarifed antimony produced by thefe proceffes was given to the Phyficians of St. Bartholomew's and St. Thomas's Hofpitals. In St. Thomas's Hofpital they were given to more than an hundred patients, fo as to give each of them to one and the fame patient in fmall dofes.

The tartarifed antimony prepared with the crocus metallorum and tartar was found to be capable of being exhibited in a larger dofe than any of the others without producing ficknefs, and to act more powerfully as a fudorific, and therefore was preferred, whe-

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ther properly or not, will be argued after-wards.

At the time the ſcience of medicine was revived with the other ſciences firſt in Italy, there does not ſeem to have been any medi-cine recommended to put an end to fever im-mediately by Galen or Celſus, or any of the Greek or Roman writers upon the ſubject, excepting cold water drunk in a large quan-ties at once. It was not ſuppoſed that a fever might otherwiſe be cured immediately ſo as to prevent any future appearance of the diſeaſe, either by preventing the returns of the paroxyſms, or carrying off the diſeaſe inſtantaneouſly, or by producing an imme-diate criſis. The doctrine then was to at-tend to the diſeaſe while it purſued its ordi-nary courſe, only taking care of the acci-dents which might happen during that courſe; that is, taking fever according to that idea of it which the author has been endea-vouring to lay down.

There aroſe in Europe ſome time after-wards a number of alchemiſts who made

 many

many proceſſes with a view to convert metals into gold. Having formed many ſubſtances by proceſſes which did not make gold, but which produced many things which they were not able to turn to any profit, they tried to apply them to the cure of diſeaſes. All ſuch chemiſts muſt be conſidered as empiricks, and the greater part of the ſubſtances which they produced were in fact of no uſe. Antimony, however, gained a reputation for carrying off ſome diſeaſes without their going through their ordinary courſe if otherwiſe left to themſelves; it is probable it was employed for this purpoſe in fever as ſoon as the time of Van Helmont.

Theſe chemiſts did not ſtudy medicine, nor did they diſtinguiſh diſeaſes, but only aimed at making ſome profit of the reſult of their proceſſes. They called every diſeaſe fever in which there was great ſenſe of heat in the patient, and greater frequency of the pulſe than in health, ſo that they not only employed preparations of antimony in fever, but in internal inflammations and various other diſeaſes.

Practitioners,

Practitioners, who were educated in the regular practice of medicine, ſtudied principally the writings of the ancient Greek and Roman Phyſicians. Theſe uſed for the moſt part vegetable ſubſtances for remedies in diſeaſes; the modern practitioners, therefore, reprobated all the ſubſtances which were the reſult of chemical operations; they conſidered them only as the boaſt of ignorant empiricks. This opinion went ſo far, that even ſo late as the time of Boerhaave, mercury was rejected by regular practitioners in the venereal diſeaſe.

Some practitioners, as there always will be men who balance between two different doctrines, employed indeed preparations of antimony, but ſuch as had little or no effect; ſuch as antimony calcined, by deflagrating it with three times its weight of nitre, and various others equally inefficacious. They of courſe did not find any advantage ariſe from preparations of antimony; they therefore reprobated the uſe of all antimonial medicines in fever. Hence it happened that they were not much employed before the time of the late Dr. James with efficacy

in Great Britain: he was a Phyſician of regular education, having ſtudied at the Univerſity of Cambridge, but was conſidered in ſome degree as an empiric in conſequence of employing ſome preparation of antimony, which he kept a ſecret.

The preparation he made uſe of conſiſted principally of antimony calcined, by mixing it with ſhavings of harts-horn, and expoſing the whole to a great degree of heat. Upon analyſing it, which was done long before his death, it was found to conſiſt of a calx of antimony, mixed with bone aſhes. It is extremely probable, that he mixed along with it a proportion of tartariſed antimony; the author knows that he purchaſed conſiderable quantities of tartariſed antimony, two pounds at a time, from an eminent druggiſt. This might eaſily eſcape the ſcrutiny of a chemical analyſis, ſince the quantity contained in one doſe did not certainly exceed a quarter of a grain. From the very eaſy decompoſition of tartariſed antimony, when diſſolved in a large proportion of water, ſo ſmall a quantity might not be obſerved.

Dr.

Dr. Cullen was the firſt eminent teacher of medicine who recommended the uſe of preparations of antimony to carry off fevers directly. As moſt of the principal practitioners of the preſent day, in this iſland of Great Britain, have been pupils of Dr. Cullen, its uſe has lately very much prevailed. If this had not been the caſe, it would have been a queſtion whether it would not have ſunk into oblivion, like any other empiric remedy whoſe preparation was kept ſecret.

Dr. Cullen conceived, that the effect of preparations of antimony aroſe from their producing ſickneſs. Tartariſed antimony is much more certain of producing ſickneſs, than any other preparation that was known to him; it was therefore preferred by him, and of courſe that preparation of antimony which produced ſickneſs in the ſmalleſt doſe he conſidered as beſt.

The author is of a different opinion; to wit, that it is not the ſickneſs produced by the preparations of antimony, that has the

effect of carrying off fever immediately, but ſome other operation of the medicine.

Firſt, becauſe there are many other remedies which produce ſickneſs to as great a degree as any preparation of antimony; yet theſe have no power whatever of making fever terminate ſooner than it would if it was left to purſue its own courſe. The root of the ſquill, for inſtance, often produces ſickneſs to a much more ſevere degree than any preparation of antimony, yet it has never been alleged, that it has the power of carrying off fever ſooner than it would go off, ſuppoſing that it was allowed to purſue its ordinary progreſs. Moreover, the author has frequently exhibited the root of the ſquill as an emetic, and likewiſe in ſuch doſes as to produce nauſea without vomiting; alſo in ſuch doſes as juſt not to produce nauſea, without ever producing any thing ſimilar to the appearances which take place in a criſis of fever, or without ever once occaſioning a fever to terminate ſooner than it would have done if left to purſue its own courſe. In ſo far, therefore, the author muſt conclude, that the ſickneſs oc-

caſioned

casioned by the exhibition of a preparation of antimony is not the cause of its carrying off fever.

Secondly, the stomachs of different men, though they are otherwise in the same situation, are affected differently by the same quantity of any particular medicine: the stomach of different persons, or of the same person at a different time, being able to bear a larger dose without its producing sickness or vomiting.

Almost every medicine given in a certain dose will produce sickness and vomiting; even opium, if given in a certain dose, that is, to the quantity of two or three grains, will sometimes produce sickness and vomiting, and sometimes purging.

When a medicine is given in such a dose as to produce vomiting, it often loses its peculiar effect. The bark of the cinchona, when given in such a dose as to produce vomiting, either from the disposition of the stomach of the patient not to bear so large a quantity as the stomachs of men will generally bear, or from its being exhibited in a

larger

larger dofe than common, will often fail in putting a ftop to the progrefs of an intermittent fever. It may be faid indeed, firft, that the peruvian bark, by producing ficknefs and vomiting, will be thrown out of the ftomach before it has time to be abforbed and carried into the blood-veffels. But the author has fhewn in his Differtation on a regular tertian, that it does not put a ftop to the progrefs of an intermittent fever by being carried into the inteftines and abforbed, but by the impreffion it makes on the ftomach and inteftines. In the fecond place, it may be faid that the bark of the cinchona, by producing vomiting, is prevented from remaining a fufficient time in the ftomach to make its impreffion there; but the author has alfo fhewn in the fame Differtation, that the bark of the cinchona exhibited half an hour before the beginning of a paroxyfm of a tertian intermittent, often makes fufficient impreffion to prevent the paroxyfm from taking place. It is often more than half an hour after the exhibition of a dofe of the bark of the cinchona before it occafions vomiting; but when it does occafion vomiting,

ing, it often does not prevent the return of the diſeaſe.

In like manner, ceruſſa acetata given in a ſmall doſe does not produce either vomiting or purging, but on the contrary a diminution of the periſtaltic motion of the inteſtines, and not uncommonly a paralytic affection of them, and likewiſe of the extremities; yet when it has been by accident taken in a conſiderable doſe, to the quantity of a dram or two, as the author has ſeen in ſeveral caſes happen, it has produced both vomiting and purging, but no paralytic affection of the inteſtines, or any other part of the body, has enſued.

The author therefore conceives, that when any remedy produces vomiting, it very often loſes by this effect its other operations on the ſyſtem, and that preparations of antimony, in like manner, if they produce vomiting, or even ſickneſs, though no vomiting ſhould enſue, loſe their effect in carrying off fever.

The

The author conceives, that every medicine given in too great a doſe acts as a ſimple ſtimulant on the part to which it is applied, and loſes its peculiar effects both on that part, and on the ſyſtem generally. Thus a moderate quantity of wine makes the ſtomach digeſt the food more readily than it otherwiſe would have done, but a large quantity of wine prevents digeſtion from taking place at all. A moderate quantity of ſpice gives a feel of warmth over the whole ſyſtem, a large quantity of the ſame ſpice produces pain in the ſtomach and coldneſs over the whole ſyſtem, and frequently ſickneſs and vomiting. It would be too great a digreſſion to enter fully on the maximum of the doſes of medicine; if the author ſhould live to finiſh theſe Diſſertations, it is a ſubject that he means to purſue.

In the third place, the author has obſerved, when tartariſed antimony has been exhibited in fevers, that when the patient's ſtomach could not bear a quarter of a grain of it prepared as has been ſaid, without producing ſickneſs, it has happened rarely

that it has produced any thing like a crifis, or in any way diminifhed or carried off the difeafe. On the contrary, when the ftomach would bear more than a quarter of a grain of tartarifed antimony, prepared in the fame way, and by the very fame individual procefs, without producing any naufea, it has very often produced critical fymptoms, or a complete crifis, fo as to carry off the difeafe. For thefe reafons, the author differs in opinion from Dr. Cullen, and believes it is not the ficknefs that has the power of producing a crifis, or any appearance of crifis in a regular continued fever.

It appears then, firft, that feveral medicines, producing as great a degree of ficknefs as preparations of antimony, have no power whatever of carrying off fever, by producing crifis, or appearances fimilar to crifis, or in any other way.

Secondly, that producing ficknefs prevents medicines generally from operating in their own appropriate manner.

Thirdly,

Thirdly, that preparations of antimony, when they produce ſickneſs in ſmall doſes, are not ſo efficacious in carrying off fever, as when it requires a larger doſe of them to produce nauſea, and alſo that they are more efficacious when no nauſea is produced; and therefore, upon the whole, that it is not the nauſea produced by preparations of antimony, that renders them efficacious in producing ſymptoms ſimilar to thoſe that take place in the criſis of a fever, and ſo carry off the diſeaſe. On the contrary, that any preparation which can be made to act with certainty in a larger doſe, without producing nauſea, is preferable for carrying off fever. Further, that tartariſed antimony, prepared by boiling crocus metallorum with tartar in water, and not purified by a repeated ſolution and cryſtallization, is the beſt manner of preparing the compound of tartar and antimony for this purpoſe.

The next queſtion is, whether tartariſed antimony prepared, as has been deſcribed, or regulus of antimony mechanically mixed with ſulphur, as in that preparation which has been called kermes mineral or the calx of antimony,

antimony, mixed with calx phoſphorata, which formed at leaſt a principal part of Dr. James's powder, and is the pulvis antimonialis of the laſt edition of the London Pharmacopeia, are the preferable preparations of antimony for immediately producing ſymptoms ſimilar to thoſe that take place in the criſis of fevers.

The regulus of antimony in the kermes mineral, the calx of antimony in the pulvis antimonialis, are neither of them ſoluble in water. It has been held by many practitioners, that ſubſtances not ſoluble in water, muſt be combined with ſome menſtruum in the ſtomach with which they form compounds ſoluble in water to be efficacious. If this be the caſe, theſe preparations of antimony, to wit, kermes mineral and pulvis antimonialis, will be ſubject to an uncertainty in their operation, by their meeting with or not meeting with a menſtruum with which they may combine ſo as to form a compound ſoluble in water.

The firſt thing then to be enquired into is, whether it be true, that if any ſolid ſub-

ſtance,

ſtance, inſoluble in water, be thrown into the ſtomach, it will act upon the ſtomach and inteſtines, or ſyſtem generally, without finding a menſtruum with which it will combine ſo as to form a compound ſoluble in water.

It is well known, that ſulphur thrown into the ſtomach in fine powder, as it is when precipitated from an alkali by means of an acid, or in fine cryſtals, as when it has been recently ſublimed, will act as a purgative.

In either of theſe caſes, if the ſulphur be perfectly pure and unmixed with any extraneous matter whatever, it is not ſoluble in water in the ſmalleſt degree. It is true, that if ſulphur be thrown into water, and left in the water with the ſurface of the water expoſed to the atmoſphere for ſome length of time, the ſulphur will combine either with the air of the atmoſphere or of the water, and form vitriolic acid, which is ſoluble in water. Sulphur recently precipitated from an alkali by means of an acid, or recently ſublimed, has not acquir-

ed any air, it acts however equally as a purgative. Moreover, vitriolic acid rarely acts as a purgative in any dose given uncombined with any other substance, whereas sulphur rarely fails of acting as a purgative.

It is therefore to be considered, whether sulphur meets with any substance in the stomach with which it will combine, so as to form a compound soluble in water.

In the first place, it meets with water in the stomach with which, it has been already said, it will not combine, nor will it be altered, excepting by long digestion, in the heat of the human body. If it should alter by combining with the pure air of the water, the acid thus formed rarely acts as a purgative; nor does inflammable air, the other element of the water, act as a purgative. It is therefore extremely improbable that it should act as a purgative, by decomposing the watery fluid that it meets with in the stomach.

The water found in the stomach is im-

pregnated with animal mucilages, ſuch as the ſolid matter of the mucus; but water, impregnated with animal mucilages, is not decompoſed more readily by ſulphur being applied to it, nor does it more readily combine with ſulphur in conſequence of its being already combined with ſuch animal mucilage. The gaſtric juice, as it is called, in counter-diſtinction to other fluids found in the ſtomach, has been thought by ſome to be a powerful menſtruum, and to unite with the food, ſo as to form chyle or ſome compound preparatory to the formation of chyle. This ſolvent power of the gaſtric juice the author has argued in his Treatiſe on Digeſtion, the reſult of which argument appears to be, that it has no ſuch ſolvent power; on the contrary, it appears that its ſole power is to coagulate certain animal and vegetable ſubſtances, ſo that they may be retained in the ſtomach until they go through that part of the proceſs of digeſtion which is neceſſary in the ſtomach. No experiments have been made to ſhew whether or not this gaſtric juice will combine with ſulphur, ſo as to form with it a compound ſoluble in water. It is extremely

improbable

improbable that it does, ſince water, combined with other mucilaginous matters, does not diſſolve ſulphur more readily than pure water. Gaſtric juice renders certain ſubſtances inſoluble in water, that are otherwiſe capable of being combined with it; it is therefore improbable, that gaſtric juice ſhould combine with ſulphur ſo as to form a compound with it ſoluble in water.

In the juices of the ſtomach, there is ſea ſalt, that is, natron muriatum; ammonia muriata, and ammonia phoſphorata, and ſometimes, perhaps, calx muriata, as there are in all the other juices of the body, but none of theſe ſalts combine with ſulphur ſo as to form a compound ſoluble in water.

Other ſubſtances are found in the ſtomach ſometimes, but not always; but ſulphur almoſt always proves purgative, and therefore does not act on the ſtomach and inteſtines, in conſequence of meeting with a ſubſtance in the ſtomach which is accidentally found there.

Sulphur, therefore, does not act as a purgative in consequence of any thing it meets in the stomach with which it forms a compound soluble in water.

Sulphur, when it gets into the duodenum, meets with bile which might combine with it, and form a compound soluble in water. The like might happen with pancreatic juice, with which it often meets in the duodenum. From the author's experiments, which it would be too great a digression to relate here, sulphur is neither capable of combining with bile nor pancreatic juice, and therefore sulphur does not act by combining with bile or pancreatic juice so as to form a compound soluble in water.

The same observations may be made with regard to the other fluids it meets with in the intestinal canal; it is at least extremely probable, that it does not combine with any of them so as to form a fluid capable of being combined with water.

Sulphur

Sulphur is capable of being combined with that vapour which Vanhelmont firſt took notice of, and called gas, but which has ſince been called fixed air, and by many other names. This vapour is found ſometimes in the inteſtinal canal. It is alſo capable of being combined with inflammable air. Neither of theſe vapours is found generally in the inteſtines, whereas ſulphur acts almoſt always as a purgative.

We muſt therefore conclude that ſulphur acts upon the ſtomach and inteſtines in a ſolid form. It is alſo capable of acting on them independently of any mechanical effect; a ſolid is therefore capable of acting on the ſtomach and inteſtines medicinally.

Regulus of antimony, and the calx of antimony made by mixing antimony with ſhavings of hart's-horn, burning them together, and expoſing them to a great degree of heat, may act upon the ſtomach without being combined with any ſubſtance, ſo that the compound is ſoluble in water, and

 therefore

therefore may act independently of any menstruum they may meet with in the ſtomach.

It has been often affirmed in medicine, that whatever was ſhewn to be poſſible, was alſo true. This is a propoſition totally repugnant to all the laws of evidence; it does not follow, therefore, that although one ſolid in powder may act upon the ſtomach and inteſtines, every ſolid does. The next queſtion then that comes to be diſcuſſed is, whether the fine powder of the regulus of antimony in kermes mineral, and the calx in the pulvis antimonialis, do act in a ſolid form without being combined with ſome ſubſtance with which they form a compound ſoluble in water.

In the healthy ſtate of the body, the fine powder of the regulus of antimony in kermes mineral, and the calx of antimony in the pulvis antimonialis, being thrown into the ſtomach, will frequently act as an emetic.

In the healthy ſtate of the body, there is no acid in the ſtomach not combined with an

an alkali, therefore neither of thoſe preparations of antimony can act in conſequence of being diſſolved by an acid in the ſtomach, unleſs they ſhould decompoſe the neutral ſalts. Whether they can decompoſe the neutral ſalts, to wit, ſea ſalt, common ſal-ammoniac, or phoſphoric ammoniac, as they are applied in the ſtomach, or whether they are ſoluble in the neutral ſalts themſelves, is not known, and therefore the argument muſt be taken on another ground.

If tartariſed antimony, prepared as has been deſcribed, be exhibited to a man in health, it hardly ever happens that a third part of a grain can be taken without producing ſickneſs and vomiting, or purging. It very rarely produces any nauſea, if taken in the quantity of a fifth part of a grain, by an adult. On the other hand, the pulvis antimonialis, or kermes mineral, will ſometimes produce ſickneſs and vomiting, taken in the quantity of three grains; on the other hand, they may be taken very often to the quantity of eight or ten grains, without producing any ſenſible effect. The

author has ſeen them often employed to the quantity of twelve or fifteen grains, without having any apparent effect at all.

Moreover, kermes mineral, and the pulvis antimonialis, the author has ſeen, in ſeveral inſtances, exhibited at the interval of ſix hours, for four and twenty hours, or forty-eight hours, without producing any ſenſible effect, and at laſt, all at once, they have brought on a ſevere vomiting and purging, ſo as to weaken the patient very much.

It muſt, therefore, be concluded, that either they are not active in a ſolid form, unleſs combined with ſome menſtruum that will form with them a compound ſoluble in water, or otherwiſe that acting in a ſolid form, they are very uncertain in their operation. In either caſe, tartariſed antimony is a preferable preparation to kermes mineral, or the pulvis antimonialis, or Dr. James's powder, which partakes of all the uncertainty of the pulvis antimonialis.

The author does not by any means ſay that tartariſed antimony, prepared as has been deſcribed, is the beſt poſſible preparation of antimony. On the contrary, he thinks that if a preparation was to be found out, of which the ſtomach would bear a much larger doſe without ſickneſs, and act with the ſame certainty, it would be preferable to tartariſed antimony, prepared as has been deſcribed.

Another circumſtance muſt be remarked. If tartariſed antimony be diſſolved in a large proportion of water, it, like all other metallic compounds with acids which are ſoluble in water, will be decompoſed, if the ſolution ſtands with a ſurface expoſed to the vapours which conſtitute the atmoſphere. It will be leſs apt to be decompoſed, if it be diſſolved in recently diſtilled water, than in river, ſpring, or rain water. It will be ſtill leſs apt to be decompoſed if combined with wine, and eſpecially a ſweet and ſtrong wine; it is, therefore, much better to keep it diſſolved in wine. The ſolution is convenient when the wine contains a quarter

of

of a grain of tartarifed antimony, in half a dram by meafure of the wine, as in the vinum antimonii tartarifati of the London Difpenfatory. Of this folution, half a drachm by meafure may be exhibited, or any greater or lefs quantity, mixed at the time of exhibition with an ounce of any watery vehicle, before it has time to decompofe.

The other preparations of antimony, excepting thofe which have been enumerated, which are hitherto known, are fo uncertain in their operations, as to make them totally unfit to be employed in fever.

It is an undoubted fact however, that other preparations of antimony than the three enumerated, have been exhibited to a patient ill of a fever, and have occafioned appearances fimilar to thofe which take place in the crifes, which happen during the progrefs of regular continued fevers left topurfue their ordinary courfe. Such crifis has terminated the fever in the manner in which it is terminated by an ordinary crifis, fo that the patient

has

has been freed from the fever in a few hours, it has not afterwards recurred ; but they act ſo uncertainly, that it is not worth while employing them.

Preparations of antimony, when exhibited to a man in perfect health in ſuch a doſe as juſt not to produce ſickneſs, occaſion, after two or three hours, a breathing ſweat, and ſoftneſs of the ſkin, not unfrequently a lateritious ſediment in the urine, open the body, and produce afterwards an univerſal tranquillity over the whole ſyſtem. They occaſion therefore appearances ſimilar, as much as can be, to thoſe which take place in the criſis of fever.

It is atteſted by many authors, that on the exhibition of Dr. James's powder, the pulvis antimonialis, kermes mineral, and tartariſed antimony, in two or three hours afterwards, or from that to five or ſix hours, the ſymptom which ordinarily ariſe in the criſis of fever have taken place, and that the fever has been carried off in leſs than twenty-

twenty-four hours, ſo that the patient has perfectly recovered.

The author has ſeen each of theſe preparations of antimony exhibited in a fever during the ordinary progreſs of the diſeaſe, in the firſt week of a fever as well as in the ſecond week of the diſeaſe. He has ſeen in leſs than five hours after the exhibition of the medicine, the ſymptoms which take place in the ordinary criſis of a continued fever ariſe, and the fever has ceaſed in leſs than twelve hours.

This effect of theſe medicines the author has ſeen, in many caſes, where there was no appearance that a criſis would have taken place in the fever, ſuppoſing that it had been left to purſue its ordinary courſe.

A criſis generally takes place, in a regular continued fever, in the night time; that is, from four to ſix, or eight o'clock in the morning; the author has ſeen it produced at other times of the day.

When theſe preparations of antimony have been exhibited, the author has ſeen fevers much more frequently carried off by criſis, than in proportion to the number of criſes which happen in fevers left to purſue their ordinary courſe. He has ſeen theſe things happen in many hundred caſes of fever; it may therefore be concluded, that theſe preparations of antimony, being exhibited in a fever, often produce ſymptoms ſimilar to thoſe which ariſe in the ordinary criſis of fever, or, in other words, a criſis ſimilar to the ordinary criſis in fever, and carry off the diſeaſe.

The next queſtion which occurs is, whether there is any other medicine which produces the ſame effects either more certainly, leſs certainly, or equally with the preparations of antimony which have been enumerated? It is matter of conſideration whether this queſtion ſhould be firſt diſcuſſed, or whether it would be better to enter into the argument in what manner the preparations of antimony, hitherto deſcribed, ſhould be employed,

employed, ſo as to have the beſt chance of carrying off the diſeaſe.

There are many reaſons that might be urged for taking the one or the other argument into diſcuſſion firſt; but it is not worth while taking up time in diſcuſſing this; it is therefore the author's determination, upon the whole view of the ſubject, to purſue the beſt method of employing preparations of antimony to produce criſis in fever, though he is not ſure that he is right, as he may be obliged, in many inſtances, to take notice of the effects of other medicines which have a ſimilar action in fevers, and produce a criſis in them.

The author has already ſaid, that when a patient is attacked with fever, it often happens that there is undigeſted food in the ſtomach, which will therefore require to be evacuated. From the fever itſelf, likewiſe, other noxious matter is probably produced in the ſtomach, in ſome degree ſimilar to that which we find covering the tongue. It is

neceſſary

neceſſary to evacuate ſuch undigeſted food, becauſe by remaining it may contaminate the food that may be afterwards thrown into the ſtomach, by exciting in it the acetous, putrefactive, or other noxious fermentations, and prevent it from being converted into a ſubſtance which is afterwards to be formed into chyle.

Vomiting in itſelf has a tendency, after the ſickneſs which produced it is over, to occaſion a glow or warmth over the whole body, followed by moiſture on the ſkin, ſoftneſs of it, an univerſal ſoftneſs and relaxation of the whole muſcles, a flow of fluids through the whole ſecretory veſſels, a general tranquillity over the whole ſyſtem, and a diſpoſition to ſleep.

Although vomiting induced by any means has this effect, in ſome degree, when the ſickneſs occaſioning it is gone off, yet it has not the ſame effect, in an equally powerful manner, when produced by any means whatever.

If

If vomiting be produced by tickling the throat, by introducing any ſolid ſubſtance into it, as a feather or the finger, or if by a cough the larynx be forced up into the throat, ſome ſenſible effect ſimilar to what has been juſt deſcribed takes place. If preparations of antimony or ipecacuanha be exhibited ſo as to produce vomiting; when the ſickneſs is gone off, the appearances of criſis, which have been above deſcribed, ariſe in a much greater degree.

Although therefore all emetics, when the ſickneſs is gone off which occaſions the vomiting, have a tendency to produce appearances ſimilar to the appearances which take place in the criſis of fever, and therefore actually tend to produce criſis in fever, yet they do not all tend to produce criſis of fever equally: therefore it is better to chooſe ſuch ſubſtances as emetics, which have the greateſt tendency to produce critical ſymptoms after the vomiting is gone off, than ſuch as have a leſs tendency to produce the appearances ſimilar to thoſe taking place in criſis, in order that the emetic may have

a better

a better chance to produce a crisis in the disease.

It is therefore better to employ preparations of antimony or ipecacuanha, as emetics, in the beginning of a fever, than warm water, infusion of camomile, white vitriol, squills, &c. which have no tendency to produce symptoms similar to those which take place in a crisis of fever, independent of the action of vomiting.

It is not always that any of the preparations of antimony known produce vomiting, when exhibited to a man either in health or in a fever. Sometimes tartarised antimony in the dose even of several grains, does not produce vomiting but purging, given either in health or to a patient affected with fever. It is wished, however, that we should be certain of producing vomiting to occasion the evacuation of any noxious matter, such as has been described, from the stomach.

Ipecacuanha, the root of a plant, which the jealous government of Spain has prevented

the perfect inveſtigation of, is very certain in its operation as an emetic, much more ſo than any other ſubſtance which is at preſent known. It has beſides the ſame kind of power which antimony has, though perhaps not in ſo great a degree, of producing thoſe appearances which take place in the ordinary criſis of a fever. It is therefore better to mix ipecacuanha with tartariſed antimony, and exhibit them ſo mixed as an emetic at the beginning of fevers.

The next point to be argued is, the doſe of the medicine we are to employ as an emetic at the beginning of fevers.

When a medicine is to be exhibited as an emetic under one view, it does not appear to be of much conſequence how large the doſe is. Let the doſe be ever ſo great, the firſt evacuation would ſeem to bring up every thing which is ſuperfluous, ſo that the ſuperfluous part of the doſe ſhould no longer act. This conſideration explains why the very various doſes of emetics which have been exhibited in various caſes, produce

produce very often nearly the ſame effect. Though this be the caſe in many inſtances, it is not in all. It happens alſo in many inſtances, that a large doſe of an emetic produces moſt violent vomiting, which is repeated many times with great diſtreſs to the patient, ſo that it would ſeem that an emetic may lie ſo long upon the ſtomach, before it is brought up, as to make an impreſſion, which laſts after the emetic itſelf is entirely evacuated.

In fevers the violence of the exertions, when an emetic thus continues to operate, perhaps ſix or eight times, in the firſt place exhauſts the force of the ſyſtem, which is not to be thrown away in this diſeaſe, and therefore on this account too large a doſe of the emetic ſhould be avoided.

Moreover, it has already been obſerved, that when any medicine is made to act in too great a degree, it loſes its proper effect, and becomes a ſimple ſtimulant. So the action of vomiting itſelf, by being too frequently repeated, from exhibiting too large

a doſe of the medicine, does not produce appearances ſimilar to thoſe which ariſe in the criſis of fever, ſo as to carry off the diſeaſe. For this reaſon ipecacuanha and antimony do not produce theſe appearances, if given in too great a doſe. Thus by giving too large a doſe of theſe medicines as emetics, the effect of carrying off the fever either by the action of vomiting itſelf, or by the effects of the antimony and ipecacuanha, are fruſtrated.

The proper doſe may be about eight grains of ipecacuanha, and one grain of tartariſed antimony.

If an emetic of almoſt any kind, which takes up a very ſmall volume, be exhibited, if there ſhould be nothing in the ſtomach to be evacuated, there ariſes an effort to evacuation, or in other words a reaching, which is attended with a great deal more uneaſineſs and pain, than if there was a quantity of ſome ſubſtance in the ſtomach to be evacuated. This has induced practitioners to give, after an emetic has been exhibited,

exhibited, watery fluids to drink, ſo that there ſhould be ſomething to be evacuated, in order to take off the uneaſineſs and pain of the reaching.

At the beginning of a fever emetics, as we have juſt obſerved, are employed for two purpoſes: Firſt, to evacuate from the ſtomach any undigeſted food which was contained in it when the fever took place, or thrown into it afterwards, or noxious matter formed in the ſtomach in conſequence of the fever. In the ſecond place, by the action of the vomiting, and of the medicines employed as emetics, joined together, to induce a criſis to the fever, ſo as to put an end to the diſeaſe.

For the firſt of theſe purpoſes, to wit, evacuating noxious matter from the ſtomach, if it were undigeſted food, two or three evacuations by vomiting are certainly ſufficient, and eſpecially if after the firſt evacuation a quantity of warm watery fluid be thrown into the ſtomach. If noxious matter be formed in the ſtomach itſelf in

 conſequence

consequence of the fever, and if that should affixed to the stomach, as the crust is to the tongue, no force will ever separate it, and if it should not be so affixed, two or three evacuations will be sufficient to carry it off; so that if two or three fits of vomiting should take place, it is sufficient for all the purposes that are wished for from the vomiting, and will not prevent either the act of vomiting itself, or the effect of the medicines, which have been enumerated as proper to produce it, from bringing on the appearances which take place similar to those that arise in the ordinary crisis of fever.

It does not seem indifferent at what time of the day an emetic is employed, if we wish it to produce any other effect than simply to evacuate the noxious matter contained in the stomach in fever.

In the first place, the operation of vomiting, after it is over, tends to produce sleep. Mankind generally are disposed to sleep about nine, ten, or eleven in the evening. If then the disposition to produce sleep,

brought on by the emetic, coincides with the ordinary time of the twenty-four hours in which there is a diſpoſition to ſleep, the two together will be more powerful in producing their effect, than either of them alone. The reſt thus procured by this double diſpoſition will be ſounder and more refreſhing, than it would have been from either of them ſimply, and will tend to reſtore and ſupport the ſtrength of the patient. Moreover, it has been obſerved, that ſleep produces a diſpoſition for all derangements of the ſyſtem to go off, and conſequently fever; it therefore increaſes the chance of the action of the vomiting, and the power of the remedies employed to produce it, in occaſioning the appearances which ariſe in the ordinary criſis of fever, and conſequently in carrying it off.

Secondly, it has been obſerved, that the exacerbation of a regular continued fever takes place generally between five and ſix o'clock in the evening, and that the effort to a criſis made in the hot fit is

ſtrongeſt about three or four o'clock in the morning. If the emetic be then exhibited between ſeven and eight o'clock in the evening, the diſpoſition to criſis produced by the vomiting itſelf, by the action of the ſubſtances employed as emetics, by the ſleep, and by the ordinary effort of the fever itſelf, will all co-operate together ſo as to have a better chance of producing a criſis in the diſeaſe.

It would therefore ſeem, when we employ an emetic in a fever, to evacuate any noxious matter from the ſtomach which has got into or formed in it by the means above deſcribed, that it is better to exhibit in a moderate doſe ſuch ſubſtances as emetics, which, if they are not exhibited in ſuch doſes as to produce ſickneſs, have a tendency to produce ſymptoms ſimilar to thoſe which take place in the ordinary criſis of fever. It ſeems alſo neceſſary to prevent the violence of the reaching by introducing ſome watery fluid into the ſtomach, but that it is better not to employ the watery fluid in too great a quantity, nor re-

peat

peat it too frequently. It is likewife better to exhibit the emetic about feven or eight o'clock in the evening. Thus the action of the vomiting itfelf, of the medicines employed to produce it, the fleep, and the ordinary effort of the evening paroxyfm of fever itfelf, will all co-operate together fo as to tend to bring on a crifis, and fo terminate the difeafe.

If any one fhould think the author is too minute in thefe attentions, he muft confider that if, by omitting any of them, a crifis fhould not be produced when it otherwife might have been, the patient may be fubjected for a fortnight, or longer in fome inftances, at leaft, to a diftreffing and dangerous difeafe.

It happens fometimes, when an emetic is employed, that with every precaution the ficknefs will continue, and the patient fhall pafs a reftlefs and diftreffing night, more fo than would probably happen if no emetic had been exhibited; but this muft be left to be confidered among the irregularities which

happen

happen in the diſeaſe. Nevertheleſs, it is neceſſary to employ an emetic to clear the ſtomach of any noxious matter that may be left in it from the laſt food that was employed, or that may be generated in it in conſequence of the diſeaſe, in as much as ſuch noxious matter would occaſion much greater diſorder if it was not evacuated.

It happens not uncommonly that when a patient has taken an emetic, eſpecially if regulated as is deſcribed above, he falls in leſs than an hour after its operation into a quiet ſleep; a gentle eaſy perſpiration takes place at firſt, and increaſes into a ſweat more or leſs profuſe; all the ſecretory veſſels are relaxed, and the ſkin and the muſcles alſo; a perfect criſis is produced, and the patient is freed from the diſeaſe.

It happens likewiſe not uncommonly, that though perfect criſis does not take place, the fever is conſiderably alleviated, and goes through its remaining courſe with leſs danger to the patient.

The author thinks, that if a practitioner be consulted in the beginning, that is, in the first four or five days, an emetic should always be exhibited in a regular continued fever.

Independent of vomiting, preparations of antimony, such as have been described, have the power of producing appearances similar to those that arise in the ordinary crisis of a regular continued fever. These preparations of antimony have been employed in two ways to produce such crisis.

First, if some one of the preparations above described be exhibited in a dose just not sufficient to produce sickness (when they have been exhibited empirically this has not been much attended to) in the evening about six o'clock; if the same dose be repeated about half an hour past eight, and again at eleven; if the patient be laid in flannel or cotton, or some other bad conductor of heat, his head bound round with a cloth of the same kind, and small quantities of some warm watery fluid, such as barley water, be given frequently, so as to throw the pa-

tient

tient into a profufe fweat if poffible; and this fweating be kept up by repeating the preparations of the antimony every four, five, or fix hours, as the patient can bear it, without occafioning any ficknefs; and if this practice fhould be continued for four and twenty hours, it has happened, in many cafes, that when the preparations of antimony, above defcribed have been exhibited in this manner, a crifis has been produced, and the fever entirely carried off. This happens particularly if the remedy be exhibited in the firft three or four days of the difeafe; the crifis is thus very evidently the effect of the medicine. There is a degree of brilliancy in this practice which has made it be adopted by many practitioners who have a degree of empiricifm.

It is to be obferved, that fuch practitioners, and all empirics, have often exhibited antimony in this manner, or fometimes in one dofe without repetition, at any time in fever, fometimes with fuccefs, but this will be confidered afterwards.

The

The mode in which antimony appears to the author to have the beſt effect, with the leaſt detrimental conſequences, is, in the firſt place, to employ it as ſoon as poſſible in the diſeaſe; for it is more efficacious in the firſt attack of the fever, than in the ſecond day of the diſeaſe, counting the days as has been before pointed out. It is more efficacious in the ſecond day of the diſeaſe than in the third, and ſo on the third than in the fourth, &c.

It ſhould be employed in the firſt place as an emetic, mixed with ipecacuanha, as has been already deſcribed. If the weather ſhould be cold, it is better to lay the patient in cotton, and treat him as has been deſcribed, in the management of a regular continued fever left to purſue its natural courſe.

After having exhibited the emetic, as has already been deſcribed, when the vomiting has ceaſed, the patient being in bed, if he ſhould continue ſick and reſtleſs, as has been above deſcribed, which is ſometimes

ſometimes the caſe, about a grain of opium, or a doſe of tincture of opium, equivalent to a grain, may be given without detriment, along with a little tincture of cinnamon or any other aromatic. This medicine ſhould only be exhibited under the circumſtances of the patient's continuing ſick and reſtleſs, in which caſe it takes off the ſickneſs, and ſuffers the antimony to act.

Six hours after the action of the emetic is over, if the patient ſhould be awake, a doſe of one of the preparations of antimony above deſcribed, ſhould be exhibited in ſuch quantity as the ſtomach can bear without ſickneſs. If he ſhould be aſleep at this interval from the laſt action of the emetic, as ſoon as he awakes it ſhould be given.

The author prefers tartariſed antimony, prepared as is deſcribed above, in the laſt edition of the Pharmacopeia of the London College.

The doſe of tartariſed antimony the author would exhibit, in the firſt inſtance,

is

is two fevenths of a grain, or if the tartarifed antimony be diffolved in wine, as is above defcribed, in the vinum antimonii tartarifati of the Difpenfatory, thirty drops of this folution dropped out of fuch a vial as is commonly made to contain two ounces in this country.

The author is fenfible of the uncertainty of meafuring any thing by drops. The quantity contained in a drop depends upon the vifcidity of the fluid dropt. Four drops and an half of alcohol, for example, dropt from the fame veffel, weigh only one drop of water, the alcohol being much lefs vifcid than the water.

Again, the fize of a drop depends upon the thicknefs of the lip of the vial from which it is dropt, or rather on that part of the lip from whence it is dropt. Thefe difficulties may be eafily obviated, by trying how many drops of any fluid dropt from one part of the lip of any one vial meafures or weighs. If the vial be not above four-fifths full, the fame number of drops, if they

they exceed twenty, will be found always nearly of the ſame meaſure and weight.

The author prefers this mode of determining the doſe as the eaſieſt and moſt readily meaſured.

It has this advantage, that if thirty drops of the vinum antimonii tartariſati ſhould produce, on its firſt exhibition, any nauſea, it may be diminiſhed by four or five drops on the ſecond exhibition. If upon this ſecond exhibition it ſhould produce no nauſea, or if upon its firſt exhibition, in the quantity of thirty drops, no nauſea ſhould enſue, an additional quantity of two drops may be added to each doſe, until the greateſt quantity is found out that the ſtomach can bear without nauſea. The author has already obſerved, that nauſea prevents the medicine from having ſuch a diſpoſition to produce ſymptoms ſimilar to thoſe that ariſe during the criſis of fever, and ſo carry off the diſeaſe. The practitioner can therefore thus aſcertain the exact doſe which can be given without producing nauſea.

If the author ſhould be miſtaken in thinking that tartariſed antimony, prepared as has been deſcribed, is the beſt preparation of antimony for producing criſis in fever already known; or if ſome better preparation ſhould be found out; yet as the ſtomachs of different men, or the ſtomach of the ſame man at different times, are differently impreſſed by the ſame doſes of almoſt all medicines, he conceives that ſome mode ſhould be taken ſimilar to that which has been deſcribed above, to aſcertain what quantity the ſtomach can bear of the preparation of antimony employed without nauſea, and that it ſhould be exhibited in that doſe.

Along with the firſt doſe of antimony to be exhibited in ſix hours after the laſt operation of the emetic, it may be proper to give a moderate quantity of ſome aromatic, ſo as to render it more agreeable to the ſtomach of the patient, ſuch as infuſion or diſtilled water of mint or cinnamon, or any other medicine of the ſame kind.

If the emetic exhibited ſhould have produced a quiet gentle ſleep, and the ſymptoms of a criſis appear; if the pulſe has returned to the ordinary number of pulſations in a given time, and the patient ſhould appear to be entirely freed from the fever; yet it will not be ſuperfluous to repeat the preparation of antimony in the manner deſcribed, as no miſchief whatever can ariſe from it, and it may ſecure the patient from the return of the diſeaſe.

After a doſe of antimony is thus exhibited, it is to be repeated at four or five, or ſix hours interval.

The interval is to be determined from the effects which this doſe has produced.

If the patient has had a criſis produced by the emetic, and a general freedom from the diſeaſe has taken place only with ſome languor, it will be ſufficient to repeat it every ſix hours, and continue it for twenty-four hours.

If hardly any relaxation ſhould have taken place in conſequence of the emetic, but all the ſymptoms of fever, ſuch as great depreſſion of ſtrength, weight about the precordia, pain in the forehead, dryneſs of the ſkin, &c. ſhould remain in a great degree, it will then be proper to repeat it every four hours, and continue ſuch repetition for four or five days.

If a preparation of antimony is given in this way at the beginning of fever, and continued for four or five days without producing a criſis, ſo that the fever is cured or converted into an intermittent, it rarely produces a criſis afterwards; nevertheleſs it often makes the relaxations greater, prevents or diminiſhes delirium, and makes the whole fever go on with leſs violent ſymptoms. It is better therefore to continue to exhibit ſuch a doſe of the preparation of antimony, as the ſtomach will bear without nauſea, every ſix hours. When ſymptoms of weakneſs begin to appear, or if the antimony ſhould produce ſweating, purging, or any other topical evacuation, without re-

lieving the fever, it is immediately to be omitted.

It happens, in many inſtances, that in the courſe of this time the patient has a moiſture produced in the ſkin, a lateritious ſediment takes place in the urine, the ſkin by degrees grows ſoft, the tongue begins to grow moiſt on the edges, and is cleared of the cruſt that forms upon it, all the other critical ſymptoms take place gradually, and the patient is freed from the diſeaſe.

If either the ſymptoms of the attack of the diſeaſe ſhould be ſo violent as to give little hopes that the patient will recover, if the diſeaſe ſhould purſue its ordinary courſe, or ſuch an epidemic ſhould be prevalent as deſtroys the greateſt number of patients afflicted with the diſeaſe; in ſuch caſes, perhaps, it might not be improper to force a profuſe ſweat in the manner that has been deſcribed.

Unleſs however there ſhould be little hopes of the patient's recovery if the diſeaſe

ſhould

ſhould go on in its ordinary progreſs, ſuch means of occaſioning ſweating ought by no means to be employed.

Firſt, becauſe ſweating, though it be one of the appearances that take place in the ordinary criſis of fever, yet it is very far from being the only one; or, not only the ſecreting veſſels of the ſkin are relaxed, and ſecrete a larger quantity than uſual, but all the other ſecretory veſſels are equally relaxed, and alſo the muſcles and whatever other part is relaxed in the ordinary criſis of fever. We ſee alſo that profuſe ſweating takes place ſometimes in a regular continued fever without any relief to the diſeaſe.

In the ſecond place, every unneceſſary evacuation tends to weaken the patient, and give him a leſs chance of being ſupported through the courſe of the diſeaſe if a criſis ſhould not be produced.

Therefore it is not proper to attempt to produce profuſe ſweating, if there be any

tolerable chance of the patient's recovery, provided the diſeaſe ſhould be left to purſue its ordinary courſe.

Hitherto the author has been ſuppoſing the patient to apply to a practitioner in the firſt day or two of the fever. In that caſe, provided the diſeaſe be a regular continued fever, by employing preparations of antimony in the manner deſcribed, ſymptoms ſimilar to thoſe which take place in the ordinary criſis of fever will be produced, as far as the author can judge from his experience, in one half, perhaps he thinks he can ſay certainly in one third of regular continued fevers.

If no medicine has been given during the firſt days of the diſeaſe, or if no emetic has been exhibited, it will be proper to employ an emetic in the manner which has been mentioned any time in the firſt week of the diſeaſe, or even on the eighth or ninth day, eſpecially if there ſhould be a greater foulneſs of the tongue, or more nauſea than in

in proportion to the other ſymptoms of the diſeaſe.

If an emetic ſhould have been employed at the beginning of the diſeaſe, and the patient at any time afterwards during the courſe of it ſhould have a greater foulneſs of the tongue, weight upon the ſtomach and nauſea, than in proportion to the other appearances of the diſeaſe, it is proper to repeat the emetic. In this caſe, about five grains of ipecacuanha ſhould only be given, which rarely fails of proving emetic. It ſhould be exhibited in the evening, but the other regulations that have been laid down for the exhibition of an emetic at the beginning of the diſeaſe, are not neceſſary to be attended to.

If no preparation of antimony has been exhibited on the firſt two or three days of the fever, the exhibition of it afterwards will have leſs chance of carrying off the diſeaſe; for after the fever has continued for longer than three days, the ſyſtem has acquired an habit which renders the diſeaſe

more fixed. Although the fooner the preparation of antimony is employed, the production of a crifis or gradual going off of the difeafe, by critical fymptoms taking place after each other, is more probable, yet the fever in many inftances will be carried off by the exhibition of it before the end of the fecond week of the difeafe. The fooner however it is exhibited, it will have the greater chance of removing the fever.

Although preparations of antimony fhould not produce a crifis fo as entirely to carry off the fever, they produce a crifis in many cafes, which though not quite perfect, yet converts the difeafe into an intermittent fever, which is a difeafe much eafier managed than a continued fever.

Suppofing preparations of antimony not to produce fuch a crifis as to convert a continued fever into an intermittent, or carry off the difeafe, yet it happens in many cafes that they give great relief to the patient, fo that the head-ach is diminifhed or entirely carried off, fuch a degree of delirium does

not take place as otherwiſe probably would have done, the primæ viæ are not ſo much diſordered, and the fever purſues its courſe without ſo much diſtreſs and danger to the patient as it otherwiſe would have done.

It happens ſometimes that there is great hardneſs, fulneſs, and ſtrength of the pulſe, as well as obſtruction; that with theſe there is fluſhing of the face and redneſs of the eyes in the firſt two or three days of the fever, and that other ſymptoms of general inflammation take place in ſuch a degree as to render it neceſſary to take away a quantity of blood; it then becomes a queſtion whether preparations of antimony ſhould be employed immediately at the beginning of ſuch fever, before blood is taken away.

This is a caſe which happens much ſeldomer than would be ſuſpected from what authors have written on this diſeaſe, and the argument will be entered into in that diſſertation in which the irregularities that take

place in continued fevers will be treated of.

If upon exhibiting preparations of antimony ſome one evacuation ſhould take place, without a relaxation of the other ſecretory veſſels, the antimony ſhould not be perſiſted in. If profuſe ſweating ſhould be produced, and at the ſame time the tongue ſhould remain dry and covered with a fur, and the patient ſhould remain coſtive and the other parts contracted: if a lateritious ſediment ſhould appear in the urine, or a flaky white ſediment, the ſkin remaining dry and contracted, and the tongue dry and covered with a fur: if the patient ſhould be purged, the ſkin remaining dry at the ſame time; in any of theſe caſes there is little hope of antimony being of any kind of uſe if the ſyſtem ſhould continue in this ſtate for forty-eight hours. It will rather tend to weaken and deſtroy the patient, and therefore ought not to be continued.

It is next to be confidered whether there is any other medicine which has the fame effect with preparations of antimony; that is, whether there be any other medicine that will induce the appearances which take place in the ordinary crifis of fever, fo as to carry off the difeafe,

In the hiftory of medicine that we are able to collect from the Greek and Roman authors, whofe writings have come down to us, there is one inftance only of a medicine having had this effect, to wit; when the phyfician of Alexander the Great exhibited to him a medicine, which is faid to have occafioned the appearances which ordinarily take place in the crifis of fever, fo as to carry off the difeafe in lefs than twenty-four hours. We have no trace of what this medicine might be, and it is fingular that the fame medicine fhould not have been exhibited to him again in that remittent, which he caught by furveying the marfhes of the Euphrates, near Babylon, in order to have them drained.

Cold water was exhibited by Greek phyſicians, in fever, often evidently with a view of immediately putting an end to the fever. From the beſt information the author has been able to make out from peruſing their writings, they exhibited it reduced nearly to the freezing temperature, in the quantity of from one to two quarts at once, ſo as to produce great evacuation by vomiting, purging, and ſweating.

It was by no means the practice of the ancient Greek phyſicians, who were the principal and almoſt only practitioners in the Roman dominions, to give watery fluids, or indeed any thing to drink at the beginning or during the paroxyſms of fever. In Petronius's ſatire, one of Trimalchio's gueſts ſays, that a man, whoſe funeral he had been at, was a very obedient patient to his phyſicians, for he did not ſuffer a drop of fluid to paſs his lips for ſeven days, and he died notwithſtanding.

It was not the practice of the Greek or Roman phyſicians to give cold water conſtantly

conſtantly to drink in ſmall quantities, but in a large quantity at once, perhaps with a view of drowning out the heat, which they conſidered as the eſſence of the diſeaſe. It was to be drunk, as Celſus ſays, *ultra ſatietatem*. It is deſcribed however as bringing on thoſe appearances which take place in the ordinary criſis of fever, and in certain caſes as carrying off the diſeaſe.

This not having been the practice during the laſt period of forty years, the author has had no experience of giving large quantities of cold water at once for drink, and cannot therefore ſay what its effect may be. During this time it has been common, in conſequence of Dr. Boerhaave's idea of rendering the fluids thinner in fever, to exhibit ſmall quantities of warm watery fluids very frequently for that purpoſe.

That warm watery fluids, forced upon the patient often in fevers, is of no manner of uſe, the author is obliged to believe from repeated experience. It would be eaſy to ſhew that every reaſon, on which this

practice

practice was introduced, was perfectly without foundation, but as no knowledge whatever is to be gained by the discussion of this point, the author does not think it worth while to draw the reader's attention to the subject.

It was also a practice among some of the ancient physicians to employ the cold bath, in certain cases of fever, to produce a crisis, and sometimes the warm bath; but the history of both these practices is so little detailed in their writings, that the author has not been able to make out their effects, or whether they actually occasioned symptoms similar to those that take place in the crisis of fever, or whether they actually carried off the disease or no.

The author has had good information, that both in Italy and Spain drinking large quantities of cold water at once, as well as using the cold or warm bath, are still in practice in diseases called by them febrile, but he could never from their books, or from the conversation of the physicians of these

countries he has feen here, make out the idea they affix to febrile difeafes, nor the actions of thefe remedies.

The author muft therefore difmifs this fubject, viz. the application of cold water, as nothing is known of it at prefent from any thing which can be confidered as evidence. It requires half a century at leaft to deftroy the bloom of novelty which deludes when a new medicine is recommended, or fix any evidence in medicine. It was a great deal longer before the bark of the cinchona was brought into general practice in intermittent fever. It was longer ftill before mercury was allowed by regular practitioners to be employed in medicine.

The next fubftance which has a tendency to produce thofe appearances which take place in the ordinary crifis of fever, is the root of ipecacuanha, an American plant, and which could not therefore be known to the ancient Greek and Roman phyficians.

The

The root of this plant was firſt brought into practice as an emetic.

There is a tendency in mankind to employ almoſt every thing in medicine; a tendency perhaps given them by the Almighty to ſupply that want of the knowledge of the ground on which medicines act, medicine being a ſcience of ſo very great difficulty. Of the ſubſtances known in thoſe countries with which Europeans were acquainted before the diſcovery of America, almoſt every thing had been tried and even celebrated in medicine. Dead men's bones, cobwebs, and the rags that enveloped the bodies of the ancient Egyptians, as well as opium, colocynthida and ſquills. Whenever, therefore, new countries were diſcovered, and in conſequence new plants, we conſtantly find practitioners in medicine uſing them in diſeaſe; ſo the root of the ipecacuanha was found out to have an emetic quality, and was employed firſt as an emetic. Afterwards, when it came into Europe, its other effects began to be inveſtigated, its action in rheumatiſm, in diarrhœa and dyſentery, and

in all which cafes it feems to be analagous in its operation with preparations of antimony.

The prefent enquiry is to determine how far it is analogous to preparations of antimony in fever.

It has been already mentioned, that if it is wifhed to produce vomiting at the beginning of fever, it is better at leaft to mix ipecacuanha with preparations of antimony, it being furer of acting as an emetic.

If at any time, during the progrefs of the difeafe, there fhould be a confiderable degree of ficknefs, efpecially if it fhould be attended with a thick brown fur upon the tongue, though an emetic has already been exhibited, it is ufeful to employ from five to ten grains of ipecacuanha to act as an emetic, as has been already obferved. It not only throws off any noxious matter that may be in the ftomach, but alfo produces moifture upon the fkin; the ficknefs is relieved, and fometimes a complete crifis takes place, and the fever is carried off.

If a ſymptomatic purging ſhould take place in fever, without any relief of the diſeaſe, if ſuch purging ſhould take place along with the fever, or ſoon after its beginning, as far as the author's experience goes, ipecacuanha is better uſed alone as an emetic. In this caſe it is alſo better to give ſuch ſmall doſes of it as juſt not to produce ſickneſs, every four or ſix hours. They have a better chance of carrying off the purging, and likewiſe of producing ſymptoms ſimilar to thoſe which ariſe in the ordinary criſis of fever, and ſo entirely carry off the diſeaſe, than preparations of antimony.

In all caſes of fever, ipecacuanha ſeems to act much in the ſame manner as preparations of antimony, in producing ſymptoms ſimilar to thoſe produced by preparations of antimony, and in many inſtances carry off the diſeaſe, though not with the ſame certainty.

If we give ipecacuanha inſtead of preparations of antimony, the ſtomachs of moſt patients will bear a grain without occa-

ſioning ſickneſs, and few ſtomachs will bear two grains without ſickneſs.

In other reſpects the ſame attentions are to be paid when we employ ipecacuanha, as when we employ preparations of antimony.

Several of the neutral ſalts, ſuch as kali vitriolatum, ammonia muriata, ammonia acetata, and ſome others, have been employed in fevers with a view of producing the ſymptoms which take place in the ordinary criſis of fever, in order to carry off the diſeaſe.

The author has ſeen moiſture of the ſkin ariſe after exhibiting them, but he cannot ſay that in any one inſtance he could determine that they brought on a complete criſis in a regular continued fever. During the exhibition of theſe neutral ſalts, an ordinary criſis ſometimes takes place, but not oftener than if they had not been exhibited, and therefore ſuch criſis cannot be ſaid to ariſe from their exhibition.

The author then upon the whole does not know of any remedy which has a tendency to produce a criſis in fever oftener than it would have taken place if no remedy whatever had been exhibited, whether ſuch remedy has a tendency to produce vomiting or not, excepting preparations of antimony and ipecacuanha. Poſſibly it may be admitted, that the ancient Greek phyſicians for this purpoſe employed cold water internally, or the cold or warm bath, or ſome other remedy with which we are now totally unacquainted, with good effect.

Semicupium, or fomenting the lower extremities with warm water, is ſimilar in ſome reſpects to the warm bath.

This practice has been uſed, eſpecially when the patient is affected with delirium in the ſecond week of the diſeaſe.

This practice is different from the warm bath, in as much as it can be employed without greatly diſturbing the patient, and in conſequence

consequence without wearing him out by exertion.

When fomentation of the lower extremities is employed, it should be applied in the evening. The bottom of the bed clothes, under the patient's lower extremities, should be covered with some covering which will prevent them from being moistened, which may be taken away after the fomentation is no longer applied.

The fomentation should be performed by moistening flannel, or any thing which is a bad conductor of heat with water, heated to about an hundred degrees of Fahrenheit's thermometer. The flannel or other substance employed should be wrung out, so as to leave very little moisture in it; afterwards it is to be applied to the legs and feet until it begins to cool. As soon as the flannel begins to feel cool, it is to be removed, and fresh flannel is to be applied moistened with warm water. The time of cooling will be different according to the heat of the atmosphere at a medium about five minutes.

Fresh flannels are thus continually to be applied for about half an hour; the covering of the under part of the bed clothes is then to be removed, and the upper part to be brought over the lower extremities of the patient, and he is afterwards to be left quiet.

It sometimes happens that a moderate sweat breaks forth, the patient falls asleep, and is considerably relieved. The author has seen in a few cases, but very few in proportion to those in which this practice has been employed, that a complete crisis has taken place, and the patient has been freed from the disease. In several cases the patient has slept, and the delirium has been considerably relieved. In the greater number of cases, however, no advantage whatever has arisen from the application, yet as it hardly tends to exhaust the patient, it is worth while to employ it.

Some, instead of moistening the flannel or other clothes with water, have employed mucilaginous substances dissolved in water,

ſuch as decoction of marſhmallow root, &c. and ſome have employed decoction of poppy heads. The author's practice has not aſcertained that any advantage has been gained by the addition of either of theſe; in caſes where there have been appearances of putrefaction, ſome have added a ſmall proportion of vinegar. This addition ſeems, as far as the author can judge from the caſes in which he has ſeen it employed, rather to have prevented the good effects of the application; but of this the author is not quite ſure.

An inflammation of an exterior part of the body in many caſes carry off diſeaſes, which have ariſen in other parts of the body.

Perhaps an inflammation of an interior part may alſo carry off diſeaſes which have taken place in other parts of the body.

Fever is one of the diſeaſes which is carried off by an inflammation of either an exterior or an interior part of the body.

It has been before obſerved, that an inflammation ariſing at the beginning of fever, particularly in the firſt paroxyſms of the diſeaſe, not uncommonly carries off the fever altogether. It has been alſo obſerved, that inflammation often produces very conſiderable affection of the whole ſyſtem, which many practitioners, both ancient and modern, have called and conſidered as fever. One principal ſcope of theſe diſſertations is to point out, that every affection of the ſyſtem, in which there is frequency of the pulſe, and an increaſed degree of heat, is by no means fever. Such affections of the ſyſtem almoſt always depend upon a continuance of their cauſe. When their cauſe is removed, the general affection of the ſyſtem goes off alſo, while the cauſe of a fever ſeldom hath any effect upon it after having made its firſt impreſſion. If it is removed, the fever almoſt always goes on; if it remains, the fever is rarely affected by it, but goes on through the ſame ordinary progreſs as if the cauſe had been entirely removed.

Thus

Thus an inflammation of the pleura generally produces at the time hardneſs, fullneſs, ſtrength, and regularity of the pulſe, which however is much more frequent in the patient than in health. With this alteration of the pulſe from its common ſtate, there is an increaſed heat, both as to the ſenſation of the patient, the phyſician, and to the thermometer. There is a cruſt formed upon the tongue, ſometimes white, more frequently of a yellowiſh hue; there is a pain in the internal part of the head, fluſhing in the face, and often delirium; there is leſs appetite, and there are other diſorders in the ſyſtem. If the inflammation of the pleura be cured, as it ſometimes is, by one copious bleeding, that is by taking away from four and twenty to thirty ounces of blood from the arm, all theſe appearances ſubſide in leſs than twenty-four hours, and the patient recovers his health, excepting that he is ſomewhat weakened: whereas, let a fever ariſe in conſequence of expoſure to cold or to infectious vapours, or almoſt any other cauſe of fever, the appearances continue and go through

their

their ordinary courſe equally, whether the cold or infection continue to be applied or not.

The author has already obſerved, that it happens often in fever that inflammation takes place at the very beginning of the diſeaſe, in the firſt or ſecond paroxyſm, and that ſuch inflammations immediately carries off the diſeaſe without any thing like the appearances which take place in the criſis of a fever, but that the fever ſimply ceaſes. If it be ſuch an inflammation as produces no affection of the ſyſtem, as external inflammations often do not, then the ſymptoms of the inflammation in the part affected with it only continue. If the inflammation be ſuch as produces frequency of pulſe, heat, and other general affections of the ſyſtem, though it ſhould ariſe from fever, if it aroſe from any other cauſe than fever, the frequency of the pulſe, and other ſymptoms, will be the ſame as if it had not ariſen from fever, and continue although the fever be cured, and ſubſide when the inflammation is carried off by means which would not affect the fever. Thus ſuppoſe in the ſecond day of fever a pleuriſy

ſhould

ſhould ariſe and cure the fever, although the fever be carried off, there remains frequency of the pulſe, foulneſs and dryneſs of the tongue, loſs of appetite, great heat, urine remaining tranſparent when it has ſtood for ſeveral hours, &c. Theſe appearances do not in the leaſt conſtitute fever, but entirely depend on the pleuriſy; and if the pleuriſy be cured by bleeding, for example, all theſe appearances ſubſide, although the bleeding would have had no effect on the fever, or carried off any of its ſymptoms, if the pleuriſy had not firſt ariſen, cured the fever, and produced theſe ſymptoms.

The knowledge that fever might be cured by exciting inflammation in ſome part of the body, may poſſibly be derived from phyſicians obſerving that a fever was actually cured in many inſtances, when an inflammation aroſe in ſome part of the body, even when no application, as far as the phyſicians could judge, was applied to excite that inflammation. The phyſician might think, therefore, that by applying ſomething that would produce an inflammation in ſome part of the

body,

body, the diſeaſe might be carried off, and that an inflammation produced by any means might have the ſame effect with that which had ariſen in the fever itſelf, without any apparent cauſe excepting the fever. He might therefore produce an inflammation in ſome part of the body by ſtimulating it with a view of carrying off the fever.

Perhaps rather that ſtrong diſpoſition in mankind not to wait the tracing of knowledge by experiment might make phyſicians ſuppoſe, that the fever depended upon ſome noxious matter being diffuſed through the whole ſyſtem, and that the application made might draw like a magnet that noxious matter into one part of the body, and produce an inflammation in that part inſtead of a fever in the whole.

It is ſtill the opinion of many practitioners, that when an inflammation carries off a fever, if it be ſuch an inflammation as tends to terminate in ſuppuration, the matter that occaſions the fever in the whole ſyſtem is accumulated in the inflamed part.

When

When the abſceſs is formed and breaks, and the pus is evacuated, many practitioners ſtill believe that the matter which firſt produced the fever is evacuated. Other inflammations, ſuch as ariſe in the ſkin for example, do not terminate in ſuppuration, but in a bliſter riſing, that is the ſcarf-ſkin ſeparates from the true ſkin, and contains in it principally the ſuperfluous water and the neutral ſalts of the blood, ſometimes along with a little ſerum, and ſometimes alſo coagulable lymph, which coagulates and gives ſome degree of ſolidity to the matter contained in the bliſter. The ſcarf-ſkin afterwards breaks, and leaves the ſkin excoriated till a new ſcarf-ſkin is formed; until that happens a quantity of the ſuperfluous water of the blood, together with the neutral ſalts, flow out. In this caſe it has been ſuppoſed that the fluids, or whatever other matter it might be that occaſioned the fever, continues to be evacuated, and that ſo the fever is carried off.

The objections to this opinion are very ſtrong: firſt, the author in his firſt diſſertation upon this ſubject, has endeavoured

to ſhew that a fever is a diſeaſe of the living ſolids only, and that all the matter of the body, during the progreſs of many fevers, had exactly the ſame properties as if the patient were in perfect health.

In the ſecond place, ſuppoſing there was any matter exiſting in the body which occaſioned the fever, that matter muſt either be confined to ſome particular part of the body, or circulated in the blood veſſels, or be thrown out by the exhalants and taken up by the abſorbents, and ſo circulated. In the firſt caſe, if it was lodged in any particular part of the body, an inflammation in another part might excite the action of the abſorbents of the part where the noxious matter was lodged, ſo as to occaſion it to be taken up and carried into the general circulation. If they did not take it up, it would remain in the part where it was at firſt depoſited, and where it produced the fever, and ſo the inflammation which carried off the fever could not poſſibly occaſion matter to be brought to the inflamed part, as is evident to every perſon tolerably acquainted with the anatomy of the human body

as

as it is now known. To bring the matter from a particular part where it produced the fever, into a part whoſe inflammation cured the fever, it is neceſſary that it ſhould be abſorbed, and carried into the general circulation. Suppoſing the matter to be abſorbed and carried into the general circulation; or ſuppoſing it is originally blended with the whole fluids in circulation, ſo as to occaſion the fever, the ſame argument will apply, and is as follows.

If any matter be in general circulation, it is mixed minutely with the whole blood. If it paſſes through the blood-veſſels only, or if it paſſes alſo through the exhalant, into the cavities and abſorbents, in both caſes it is mixed with the whole blood returning from every part of the body, in the right auricle of the heart. The motion which takes place from the right auricle to the right ventricle, mixes it ſtill more thoroughly with the whole blood. It is ſtill more perfectly intermingled with the whole of the fluids in paſſing through the lungs, and again in the left auricle and left ventricle, ſo that it muſt be blended moſt perfectly, and moſt minutely in the aorta, ſo

intimately

intimately as to be equally diſtributed through all the veſſels. It paſſes through them with ſuch velocity that no difference of ſpecific gravity can prevent its being equally diſtributed to every part of the body. If then there be no particular ſtructure in any part of the body by which ſuch matter may be caught, it will circulate equally through the whole body.

If there was any ſtructure in any part of the body in its ordinary ſtate, by which the matter of a fever could be caught, and would produce inflammation, then it would be the inflammation of that part only which would carry off fever. But the inflammation of any part of the body indiſcriminately, in many inſtances, carries off fever, and therefore there muſt be a change in the ſtructure of the part in which the inflammation ariſes, in order to account for the matter's being caught in that part, no ſuch change has been ſhewn by any experiment, nor any cauſe of ſuch change, ſo that we have an unknown thing, endeavoured to be accounted for by a thing equally

We muſt therefore ſimply conclude, that an inflammation ariſing in any part of the body without any apparent cauſe, excepting the fever itſelf, in many caſes terminates the fever. How, or why this happens, is not as yet inveſtigated; we are only led from this fact to enquire, whether inflammations excited by certain cauſes which produce that effect may not be employed to carry off a fever, as well as thoſe which ariſe without any apparent cauſe.

The author has ſeen in ſeveral inſtances inflammation, produced by applying ſtimulants to a part of the body, when a patient is affected with fever, carry off the fever entirely in the ſpace of twenty-four hours.

When an inflammation is excited in the exterior parts of the body, ſo as to carry off a fever, it does not produce appearances ſimilar to thoſe which take place in the ordinary criſis of fever; but the fever ſimply ceaſes, the head-ach goes off, the tongue becomes clean, depreſſion of ſtrength leaves the patient, all the evacuations come

into their ordinary ſtate as in health, the patient ſleeps, and has his appetite reſtored.

Though an inflammation produced in any exterior part of the body now and then carries off fever entirely, yet it has but ſeldom this effect; it only commonly alleviates the diſeaſe, or takes off ſome of the ſymptoms; it ſometimes carries off head-ach or diminiſhes it; it diminiſhes, rarely carries off delirium entirely if it has ariſen; and ſo of the other appearances which take place in fever.

Since exciting an inflammation ſometimes alleviates and carries off the ſymptoms of fever from particular parts of the body, if it ſhould happen that one part of the body ſhould be more affected in the fever than the other parts, an inflammation excited near that part is more apt to carry off the particular affection of that part, than one excited at a diſtance. If, for inſtance, there ſhould be great pain in the forehead, an inflammation excited behind the ears is more

apt to carry off that pain, than if it had been excited in the back; if there ſhould be great affection of the breaſt, an inflammation excited in the ſkin of the breaſt will be more apt to relieve the breaſt, than if it had been excited in the extremities.

There are ſeveral ſubſtances which, when applied to the ſkin, will excite inflammation, viz. muſtard ſeed bruiſed, horſe-radiſh, and many other of the claſs tetradynamia of Linnæus; many of the ſpecies of allium; euphorbium, and other reſinous ſubſtances; as well as cantharides, ammonia, and many others. Of theſe modern practitioners have generally choſen to employ cantharides to excite inflammation in fever, ſometimes muſtard ſeed.

If cantharides be powdered, and mixed with an oily or watery ſubſtance, and applied to the ſkin, they excite an inflammation in the ſkin; this is followed by a bliſter, in which the ſcarf-ſkin is raiſed from the true ſkin, ſo as to contain in it a watery fluid. When the ſcarf-ſkin is broke, this

fluid flows out, and the ſame kind of fluid continues to ooze out from the ſkin for ſome time afterwards.

Upon examining this fluid the author has found it to contain water, in which is diſſolved natron muriatum, ammonia muriata, and ammonia phoſphorata, with a little mucilaginous matter, ſometimes ſerum. The fluid oozed out therefore contains the ſuperfluous water, together with the neutral ſalts commonly contained in the blood-veſſels and the putreſcent mucilage. Nothing, therefore, which is not commonly contained in the blood-veſſels of a man in health, is found in this fluid, but the ſuperfluous water, neutral ſalts, or putreſcent mucilage of the blood, were never known to occaſion fever in a man in health. There is therefore no reaſon to ſuppoſe, that it is this particular fluid which occaſioned the fever, or that this evacuation is of any conſequence; it is not in ſufficient quantity to weaken the patient. The whole effect, therefore, of the application of cantharides, in as far as they produce this evacuation, muſt be

ſidered

confidered as of no confequence; it is the inflammation only which carries off the fever or its fymptoms.

The juice of cantharides is often abforbed by the veffels of the fkin, and carried into the general circulation of the blood, as is evident from its ftimulating and occafioning inflammation of the neck of the bladder, when cantharides are applied to the fkin, fo as to inflame it.

Some have been of opinion that the juice of the cantharides fo abforbed produced fome effect upon the matter which occafioned and kept up the fever: fuch opinion, however, is not founded on any experiment. That there is any peculiar matter in the body keeping up a fever has not been fhewn by any experiment, much lefs has it been fhewn that the juice of the cantharides has any effect upon fuch matter. This opinion, therefore, refting upon nothing more than an idle dream, it cannot be made a foundation for any medical practice.

Many animal poiſons abſorbed, and carried into the ſyſtem by their action on the irritable parts, occaſion ſpaſms or involuntary contractions of the moving parts of the body. The ſame effect is alſo now and then produced by the juice of cantharides, when it is abſorbed and carried into the ſyſtem. The author has, in ſeveral inſtances, ſeen ſubſultus tendinum, in women eſpecially, and alſo more violent ſpaſmodic affections, ariſe from the application of bliſters in fever as well as in other diſeaſes; the abſorption, therefore, of the juice of cantharides, when it has this effect, ſo far from being uſeful, is evidently hurtful. But this does not happen often enough to prevent cantharides being uſed.

Cantharides are therefore better employed to excite inflammation with a view to carry off or alleviate fever, than other ſtimuli, as they moſt readily produce inflammation, the inflammation produced by them is carried off the eaſieſt, and is more readily kept up if that ſhould be wiſhed; though ſometimes the abſorption of their juice pro-

duces

duces ſpaſmodic affections, which occurs but rarely, and ſoon go off, if the cantharides are no longer applied, generally in leſs than twenty-four hours; though they are apt to produce ſtrangury, which may be obviated or alleviated by employing mucilaginous medicines, ſuch as gum arabic diſſolved in barley water.

How theſe mucilaginous ſubſtances produce their effect, the author cannot ſatisfy himſelf, but that they do produce the effect in many caſes is certain. The author has ſeveral times applied cantharides ſo as to excite inflammation to more than forty patients running. To the one half of them he has given mucilaginous ſubſtances diſſolved in water, and in the other half has not; many fewer of thoſe patients who took the mucilaginous ſubſtances were affected with ſtrangury, than of thoſe to whom the mucilaginous medicines were not exhibited.

Some have preferred the application of muſtard ſeed, or ſome other of the claſs tetradynamia and genus allium, to

the feet and legs in cafes of delirium in fever.

This practice feems to have arifen from the doctrine of derivation, viz. to derive the matter as far from the head as poffible, which is mere hypothefis. In practice it is found, that if any particular part of the body be afflicted with a difeafe, an inflammation produced in another part carries off the difeafe more certainly, if the inflammation is excited near the difeafed part, than if excited at a diftance. The proof of this, however, would be a digreffion too long to be entered into here, more efpecially as he believes it is generally acknowledged.

Suppofe then that cantharides are preferred to excite inflammation in fever, the next queftion will be in what cafes fuch inflammation fhould be produced.

Suppofing that a patient is feized with a regular continued fever, and that the practitioner had no other means of putting a ftop to the difeafe excepting by exciting an inflammation;

flammation; or ſuppoſing that he has employed preparations of antimony or other medicines already enumerated, without being able to induce a criſis in the fever; or even ſuppoſing that there were other means of inducing a criſis to the fever or carrying it off immediately without any critical ſymptoms; and ſuppoſing the fever was perfectly regular and affected the whole ſyſtem equally, in any of theſe caſes it is often worth while to attempt to carry off or alleviate the fever, by exciting an inflammation, by means of cantharides in the ſkin between and over the ſcapulæ about ſix inches ſquare. If the fever ſhould be carried off by this means, the inflammation may be ſuffered to go off and the bliſter to heal.

The circumſtances being the ſame, and the cantharides having been applied, and an inflammation produced, if the fever ſhould not be carried off, nor in the leaſt alleviated, the application of cantharides, or any other ſtimulant to produce inflammation a ſecond time, rarely relieves the diſeaſe, and therefore it is not worth while to keep up or renew

new the inflammation of that part or any other part of the body; it will only wear out the ſyſtem, and give the patient a leſs chance of ſuſtaining the ordinary courſe of the diſeaſe

Suppoſing the circumſtances are the ſame, and the diſeaſe is alleviated, but not carried off, it may be adviſeable to excite a new inflammation after the firſt is carried off. If this new inflammation ſhould not carry off, or very much alleviate the whole diſeaſe, a third inflammation is not to be attempted. The conſtant ſtimulus kept up by the remedies employed to excite a third inflammation, and the inflammation itſelf, will wear out the patient ſo much, that no probable advantage ariſing from it can compenſate for the miſchief.

When a patient is going through the long progreſs of a fever, which takes up perhaps one and twenty days, or even longer, when no medicine has been tried or has been found capable of preventing it continuing its ordinary courſe, the practitioner,

and much more thofe about the patient, lofe their patience, and the latter wifh that the practitioner would exert himfelf, and do fomething efficacious. In this cafe he is often compelled by thofe about the patient to apply cantharides to excite inflammation, notwithftanding the inflammation will probably be of no manner of ufe, but tend to wear out the patient. The relations and nurfe, and by-ftanders, are fatisfied with what they call a fine blifter, and the practitioner's doing fomething. This certainly ought to be no inducement to a practitioner to torment the patient with an additional difeafe, or to wear him out by producing additional action, and fo give him a lefs chance of going through the ordinary courfe of the difeafe.

It happens often that fome part of the body is more affected in fever, than in proportion to the affection of the fyftem generally. This forms an irregularity in fever; but not to have to recur to the excitement of inflammation again, the author means to notice it here.

Sometimes

Sometimes there is a much greater head-ach, that is, pain in the exterior part of the forehead, or all round the head, than in proportion to the febrile affection of the other parts of the ſyſtem. In this caſe, at the very beginning of the diſeaſe, cantharides applied behind the ears, ſo as to excite inflammation, often relieves the head-ach, and ſometimes carries off the whole fever. The ſooner the inflammation is excited, the greater is its power, and therefore under ſuch circumſtances it is better to apply them ſo as to excite inflammation and occaſion a bliſter, in the firſt two or three days of the fever.

Sometimes delirium ariſes earlier than we ſhould expect from the other appearances of the diſeaſe. In this caſe, an inflammation produced by cantharides, ſo as to occaſion a bliſter to ariſe on the head after removing the hair, or on the ſkin of the neck, or between the ſcapulæ, has ſometimes conſiderable effect in diminiſhing, ſometimes carries off the delirium, and even ſometimes it carries off the whole diſeaſe.

Sometimes the breaſt is more affected than in proportion to the appearances of fever in other parts of the body; there is for inſtance ſometimes a greater weight and oppreſſion about the precordia, than for the appearances of fever in the other parts of the body; ſometimes greater difficulty of reſpiration, attended with cough; ſometimes greater frequency of the pulſe. In all theſe caſes, when they ariſe from greater affection of the breaſt, exciting an inflammation in the ſkin over the ſternum, has often given conſiderable relief, ſometimes has carried off the whole fever.

It is to be remarked in all theſe caſes of topical affection, that if the firſt inflammation excited, or bliſter produced, neither alleviates the appearances in the particular part of the body, nor diminiſhes the whole fever, a ſecond or third inflammation, excited by cantharides or otherwiſe, has ſeldom any beneficial effect, but tends to irritate the whole ſyſtem and wear out the patient, ſo as to render him unable to be ſupported through the remaining progreſs of the diſeaſe.

If the inflammation fo excited fhould have given confiderable relief, in that cafe keeping up the inflammation, or which is preferable, renewing it after it is gone off, is often ufeful.

In all cafes where inflammation is excited either to carry off the fever totally, or to alleviate the fymptoms when they have taken place in a greater proportion in one part than in the whole fyftem, the fooner it is excited, the more it is likely to prove efficacious, excepting there fhould be great hardnefs, fulnefs, and ftrength of the pulfe, and other appearances which would render evacuation by bleeding neceffary, but this is rarely the cafe. The practice, however, has rather been to leave the excitement of inflammation till later in the difeafe, with a view perhaps to the practitioner's having fomething to do to fatisfy the patient and bye-ftanders, rather than appear to allow the difeafe to go through its ordinary courfe.

It often happens that in the courfe of a regular continued fever delirium takes place.

This

This delirium has been defcribed in the former part of this differtation, as of two different kinds: the firft, in which there is no appearance of affection of the brain, either when the patient is alive, or upon diffection: the fecond, in which, when the patient is alive, there is fulnefs of the veffels of the eye, flufhing in the face, and on diffection the veffels of the brain are much fuller of blood than they are found to be in men killed by accidents, which have no effect upon the brain.

Both thefe fpecies of delirium generally begin towards the end of the firft week of the difeafe, but prevail principally in the fecond week. In the fecond fpecies, taking away blood by opening the external jugular vein, and letting five or fix ounces of blood flow out, has diminifhed the delirium confiderably, fometimes has carried it off entirely, and with it the whole fever. The fame effects have been produced by applying two, or three, or four leeches, and allowing them to fall off of themfelves, and afterwards applying cloths moiftened with

warm

warm water, and allowing the wounds to bleed for four or five hours. This laſt method is more efficacious. In ſuch caſes of delirium, therefore, it is proper to take away a ſmall quantity of blood. The quantity of blood to be taken away ſhould be according to the ſtrength of the patient; if his ſtrength be much diminiſhed by the fever, or otherwiſe, the application of one leech to each temple is of conſiderable uſe.

Taking away blood from the arm, or any other part of the body diſtant from the head, is of no manner of uſe, as the author has ſeen in a great number of caſes. It was much the practice about the year 1760, to take away blood from the arm in caſes of delirium of both kinds, the practitioners believing that delirium aroſe from inflammation of the brain; but the author never ſaw any advantage ariſe from this practice.

In delirium of the firſt kind, where there does not appear any ſymptom of fulneſs of the veſſels of the brain, the author has not ſeen any advantage gained by taking away

blood

blood in any way from the head, or from any other part of the body.

At the beginning of fever, it happens ſometimes that very violent pain takes place in the forehead, which feels to the patient as if it affected the integuments of the cranium, and were merely external. In this caſe the author has ſeen three or four leeches applied to the temples give conſiderable relief to the patient by removing the pain, and ſometimes they have carried off the whole fever.

The author cannot conceive in what way ſuch evacuation from the veſſels of the head ſhould be of uſe, when taking away blood from a diſtant part of the body is of none. Every man verſed in anatomy muſt know, that from whatever part of the body blood is taken, it is the ſame blood, excepting for the difference there is between arterial and venous blood, which are to be converted the one into the other in a few ſeconds.

The veſſels of the exterior part of the head have very little connection with the

veſſels of the interior parts, ſo that taking away blood from the temples by means of leeches can have very little influence on the circulation of the interior parts. The reaſon why ſuch topical evacuations by bleeding carry off or diminiſh the delirium or pain in the forehead, or even ſometimes the whole fever, is wholly unknown to the author. The only thing that he knows with regard to it is, that it is often effectual, which was long ago taught to him, and which he has found confirmed by repeated experience.

In this caſe, as well as in the application of all the remedies employed to carry off or relieve fever, the effect is uncertain. Sometimes this topical evacuation is of very great advantage, or evidently carries off the fever without occaſioning any of the appearances which take place in the ordinary criſis of the diſeaſe, and not unfrequently it has no effect at all. As ſo ſmall an evacuation can hardly be of any diſadvantage to the patient, it is worth while to employ it in the caſes which have been enumerated.

The

The moſt conſpicuous appearance, which takes place in the criſis of fever, is profuſe ſweating. Whatever ſubſtances, therefore, tend to produce profuſe ſweating ſuggeſt themſelves as remedies proper for carrying off the diſeaſe. Spices are among the ſubſtances which tend to occaſion profuſe ſweating, and have therefore been conceived to be proper remedies for carrying off the diſeaſe.

The great depreſſion of ſtrength, and great ſenſe of coldneſs, which take place at the attack of fever, and when the coldneſs is gone off the great depreſſion of ſtrength which continues, ſuggeſt the propriety of employing ſuch powerful ſtimulants as pepper, cinnamon, nutmegs, capſicum, &c. to prevent the patient from ſinking under the diſeaſe.

The impreſſion made by the appearance of weakneſs in the patient, and by ſeeing the fever carried off by a criſis in which profuſe ſweating takes place, has determined all nations in the beginning of medicine

to employ ſuch powerful ſtimulants as the ſpices enumerated, or the moſt powerful they could procure, to produce a criſis; practitioners have alſo employed them to ſupport the ſtrength of the patient. It is not till medicine has ſubſiſted for a long time in any country which has had no communication with others, or until the practice of other nations who have had much longer experience in medicine has been communicated to them, that ſuch ſtimulants have been thrown aſide, or the cool regimen, as it has been called, has come into practice.

It is moreover to be obſerved, that many practitioners in medicine have been nearly or totally without that education, which could teach them the knowledge of the experience of thoſe practitioners who went before them, and in conſequence on what ground the practice of medicine is founded. Unfortunately, in all the ſchools of medicine, the profeſſors have been more anxious to infuſe into the minds of their pupils ſome hypotheſis, rather than a true hiſtory of the

diſeaſes

difeafes they have treated of, or the efficacy of the remedies which have been employed.

It is not therefore at all to be wondered at, that the application of fpices, and other powerful ftimulants, fhould often be re-introduced. The fame depreffion of ftrength, which originally brought fpices and other fuch ftimulants into practice, and the profufe fweating which takes place in the crifis of the difeafe, have made untaught and unexperienced practitioners fall into the fame train of thought, and the fame practice that prevailed in the rude ftate of medicine, that is, to keep up the force of the patient, or to bring on fweating, fuppofing by that means to occafion a crifis in the fever. This is called the warm regimen, and has been thus brought forward repeatedly.

For the fame purpofe the patient has been kept in an air of a very warm temperature, and covered with bed-clothes that are bad conductors of heat, and with the fame effect.

It has been already ſhewn, that ſtimulating the body when there is depreſſion of ſtrength, but not actual weakneſs, is a means of exhauſting the powers of the ſyſtem inſtead of increaſing them. It remains to be enquired whether ſweating, produced by ſimple ſtimulants, or keeping the patient in a warm atmoſphere, or loaded with clothes, will produce a criſis or carry off the diſeaſe.

Sweating alone does certainly not carry off a regular continued fever. Every practitioner, who has ſeen a moderate number of patients afflicted with regular continued fevers, muſt have obſerved ſweating frequently take place without carrying off, or even producing the ſmalleſt alleviation of the diſeaſe.

In the criſis of fever, there is not ſweating alone, but a univerſal increaſe of the ſecretions. The tongue becomes moiſt, the cruſt covering it is exfoliated; a laxity takes place in the inteſtines, ſometimes a conſiderable purging; the ſkin regains its

healthy appearance, and is no longer contracted upon the mufcles; a relaxation every where takes place. None of thefe other appearances happen when fweating is produced by ftimulants, or keeping the patient in a warm atmofphere, or covered with clothes, non-conductors of heat: on the contrary, the mouth becomes more parched and drier, and the thirft is increafed; the inteftinal canal is more conftipated; the patient is far from being relieved from any part of the difeafe.

If therefore the attempt to carry off the difeafe by ftimulating by means of the remedies enumerated, or keeping the patient hot, is viewed in any light, it is to be totally rejected.

It happens not uncommonly in the human body, that a mufcle contracts without any volition in the man, or even againft and contrary to his will, and when there is no apparent ftimulus applied either to the part itfelf, or to any other part of the fyftem. Although this contraction is often, in a

very great degree, yet the two ends of the muſcle cannot be brought nearer each other, becauſe it is counteracted: in this caſe the body of the muſcle generally ſwells, and occaſions pain to a violent degree. This contraction has been called ſpaſm.

This kind of contraction takes place not only where there are evident muſcular fibres of a red colour, but in all the other parts of the body which have a power of contraction ſimilar to muſcular contraction, and not at all depending on their elaſticity. For example, the gaſtrocnemii muſcles of the leg contract without any volition or againſt the volition, and without any ſtimulus being applied; the belly of the muſcles ſwells, and is extremely painful; ſo in like manner the ſkin contracts upon the interior parts, and produces an uneaſy or painful ſenſation without the patient's volition, and when no apparent ſtimulus is applied.

That there is ſome cauſe for ſuch contraction taking place there can be no doubt, but it is a cauſe that is imperceptible.

Such contractions are called ſpaſm, properly and ſtrictly ſpeaking. Contractions which ariſe from ſtimuli, applied either to the part itſelf or to ſome other part of the body or from affections of the mind, have been called in a vague ſenſe ſpaſms likewiſe.

The contractions which, ſtrictly ſpeaking, are called ſpaſms, ſometimes laſt for a very ſhort time, not above a minute or two, and then go off; ſometimes they continue for a more conſiderable length of time, and produce affections of the ſyſtem which have been fatal. The ſpaſm of the muſcles of the leg for inſtance, which is called the cramp, does not laſt above a minute or two; it goes off, leaving a degree of ſoreneſs behind. A ſpaſm of the annular muſcular fibres of the inteſtines continues for two or three days; it produces extreme pain in the part, and a more frequent contraction of the heart, and in conſequence more frequent pulſation of the arteries, ſo that they often beat more than one hundred and twenty times in a minute. A great depreſſion of ſtrength in the whole ſyſtem comes on,

on, a loſs of appetite, difficulty of reſpiration, and derangement of all the other functions of the ſyſtem take place; ſometimes the effects prove fatal in a few days, or even hours.

It has already been ſhewn, that in fever there is contraction of the parts which have muſcular power generally, and that fever often ariſes from cauſes perfectly unknown. Here is, therefore, a contraction in certain points ſimilar to what is called ſpaſm; ſome practitioners have, therefore, conſidered fever as a ſpaſmodic diſeaſe, and the whole of it as conſiſting entirely of a ſpaſmodic contraction of all the parts of the body which have a power of muſcular contraction totally independent of their elaſticity.

It is to be remarked, however, that contractions of the various moving parts is but a part of the diſeaſe; there is, beſides this contraction, a depreſſion of the powers of the body. This ariſes even before there is any appearance of contraction, and in many caſes it is by no means in proportion either

to

to the degree or universality of the contraction. This depression continues in many instances when the contraction in many parts of the body is gone off. There is likewise a regularity in the attacks, hot fits, and crisis of the disease, not at all similar to what happens in those contractions which are called spasmodic, these being almost always vague and irregular.

There are certain remedies which, being applied to the stomach or skin, or some other parts of the body of a patient affected with spasmodic contractions, in many instances will immediately carry off the spasm. In a spasmodic contraction of the muscles of the calf of the leg, æther poured upon the skin of the leg will, in some cases, immediately carry off the contraction.

It is to be remarked with regard to these medicines, that they have something peculiar in taste and smell, which we have not sufficient words to express; indeed we have few words to express the sensations which

which we receive from the tafte and fmell. Thefe fenfations are at leaft, at firft, what we call fetid to the fmell; their particular odor has given a diftinction to thefe remedies.

Thofe which we commonly call antifpafmodic, are fome plants of the natural clafs of ringent flowers, by Linnæus, called didynamia gymnofpermia, fuch as mentha pulegium, &c. Some of the natural clafs of umbelliferous plants, which come under the pentandria digynea of Linnæus, as ferulla affafœtida, &c. fome plants which have compound flowers, moft of which are contained in the fyngenefia of Linnæus, as matricaria, &c.; fome medicines, the product of chemical proceffes, fuch as æther, &c.; fome found in animals, as mufk, &c. Moft of thefe have been ufed to take off fpafmodic affections, and feveral of them have been ufed in fever, with a view of taking off fever immediately, or gradually diminifhing the difeafe.

It has been already ſaid, that æther and oleum vini, diſſolved in alcohol, ſometimes produce ſleep, in which ſleep a criſis of the fever now and then takes place, and the diſeaſe is entirely carried off; but this has been ſufficiently treated of in the firſt part of this diſſertation.

Reſinous ſubſtances, ſuch as galbanum, ſagapenum, oppoponax, &c. have ſometimes been made uſe of, but rather as laxatives, than with a view of carrying off the diſeaſe. Aſſafœtida, gum ammoniac, procured from the ſame claſs of umbelliferous plants, though they have been much employed as antiſpaſmodics in other diſeaſes, yet as far as has come to the knowledge of the author, they have not been made uſe of with a view of carrying off or diminiſhing fever.

Muſk has been employed, in many caſes, towards the end of a regular fever, where the ſtrength has been much diminiſhed, with a view however rather of ſtimulating and keeping up the ſtrength of the patient, than

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as a medicine applicable to the carrying off or alleviating the fever itſelf: it certainly, as far as the author can judge from frequent experience, has been of little uſe in either ſupporting the ſtrength or alleviating the diſeaſe.

Caſtor has been employed in many inſtances, but eſpecially along with ſmall doſes of opium, as has been deſcribed in the former part of this diſſertation. The author thinks he can ſay, from his experience, this has been done with very conſiderable advantage in aſſiſting the opium in producing a degree of ſtupor and ſleep, ſo as conſiderably to alleviate the diſeaſe.

Camphor, a very peculiar ſubſtance, produced by the cryſtallization of the eſſential oil of the laurus camphorifera, and found often in cavities formed by the cracking of the tree itſelf, has been very much uſed, particularly in the ſecond and third weeks of a regular continued fever.

This ſubſtance has been ſo much and ſo univerſally employed by the very firſt practitioners

tioners in medicine, by thoſe of the greateſt ſkill as well as of reputation, that the author's practice can be put in no competition with their opinion. There are many things, however, that make him dubious of its efficacy, either in alleviating or carrying off the diſeaſe. In the firſt place, he has frequently employed and omitted it throughout the ſecond and third weeks of a regular continued fever, in ſimilar caſes, without obſerving that the fever was more alleviated in the patients who made uſe of the camphor, than it was in thoſe patients who did not make uſe of it.

In the ſecond place, the doſe which has been commonly employed in what is called the camphor mixture, cannot poſſibly amount to two grains, whereas the author has frequently exhibited to patients in regular continued fevers upwards of ten grains, and to patients in other diſeaſes twenty, forty, and even ſixty grains of camphor, without producing in moſt caſes any ſenſible effect. Sometimes indeed when given in the quantity of thirty grains and upwards, it has occaſioned a little giddineſs and ſtupor,

which however have ſoon gone off. He does not think, therefore, that in ſo ſmall a doſe it can be very efficacious.

Again, in a fever which is running on for two or three weeks, and in which no efficacious medicines have been employed with ſucceſs, but the diſeaſehas gone on in its ordinary courſe, the flavour of camphor gives the appearance of the practitioner's doing ſomething efficacious, or at leaſt attempting to do ſomething while he is regarding the progreſs of a fever purſuing its ordinary courſe. It is weariſome to the patient, as well as to the bye-ſtanders and to the practitioner, to conceive that no remedy having any efficacy can be exhibited. This, the author ſuſpects, has been the cauſe that camphor has been exhibited; its flavour, however, often diſagrees with the patient's ſtomach, and produces ſickneſs or nauſea that prevents him from uſing food of ſufficient nouriſhment.

The author has all along conſidered a regular continued fever to be ſimilar to a re-

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gular intermittent, consisting of ephemeræ following after each other at certain periods of time. He has said that the difference between an ephemera and an intermittent is, that an ephemera consists of one attack of fever only, while a regular intermittent consists of several paroxysms of fever following after one another, one paroxysm going off entirely, before the next paroxysm begins to take place, and the patient appearing in the intervals of the paroxysms nearly or entirely in perfect health, as far as is sensible to the practitioner or the patient.

He has also said, that the bark of the cinchona being exhibited during the interval between the paroxysms of a regular intermittent, has a power of preventing a fresh paroxysm from making its appearance, so that the patient shall continue in perfect health. He has said also, that the difference between a regular intermittent and a regular continued fever is, that the paroxysms of the intermittent are terminated by crisis, but that in a continued fever a new accession takes place before the crisis of

the former paroxyſm begins. If it be true then that a regular continued fever differs only from a regular intermittent in the paroxyſm of the continued fever not having reached the period of a criſis before a new paroxyſm takes place, it might be ſuppoſed that if a ſufficient quantity of the bark of the cinchona was exhibited during a previous paroxyſm of the fever, that it would prevent the next paroxyſm from taking place, and give time for the preſent paroxyſm to reach its criſis, or gradually ſubſide.

This reaſoning is ſo obvious, that many practitioners have given large doſes of the bark of the cinchona with a view of preventing another paroxyſm from taking place in a regular continued fever, and ſo carrying off the diſeaſe. Many practitioners have likewiſe exhibited it, without any other reaſon than that if the bark of the cinchona cures an intermittent fever, it ought alſo to cure a continued fever. Both theſe ſets of practitioners have employed the bark of the cinchona in powder to the quantity of one, two, or three ounces in twenty-four

four hours, and in ſeveral inſtances with ſucceſs. The fever in this caſe ſometimes has been carried off with an evident criſis, happening later than the criſis of the paroxyſm in which it was given would have taken place, and the fever has not returned, or the ſymptoms have gradually diſappeared in leſs than forty-eight hours, and the patient has been reſtored to health.

When a young practitioner has ſucceeded with any medicine in carrying off a diſeaſe once, he always expects to ſucceed; as Sydenham obſerves of himſelf when he employed the juice of the ſpina cervina in dropſy. In like manner, the exhibition of the bark of the cinchona having ſucceeded in ſome caſes in carrying off a continued fever, theſe practitioners have been warm in their recommendation of it in all caſes of the diſeaſe; after a little time, however, moſt of them have left off the practice, finding it far from ſucceeding always. If it had even ſucceeded ſometimes, without any detriment to the patient, they would not have been prevented from employing it, eſpecially

when they had committed themſelves by teſtifying its efficacy in the ſtrongeſt terms.

The author has ſeen many caſes in which it has been employed in a regular continued fever, ſometimes with ſucceſs, but it has much oftener failed of ſucceſs. Where it has failed, the relaxations which began to take place in the diſeaſe have been much diminiſhed, the pulſe has become more frequent in the morning, the head-ach more conſiderable, the ſkin drier, the tongue covered with a thicker fur, the coſtiveneſs greater, if the patient was not thrown into a purging, the oppreſſion upon the precordia greater, and likewiſe the difficulty of reſpiration increaſed. On the following evening the head has alſo been much more affected, that is, the confuſion and delirium have been much more conſiderable, and the patient altogether worſe than he probably would have been if no remedy whatever had been exhibited, and there has been leſs chance of criſis in the fever, and it has been longer of being worn out.

In a regular continued fever, therefore, the bark of the cinchona ſeems to have a greater chance of doing miſchief than good, if it be employed in large doſes, ſo as to attempt to carry off the diſeaſe at once. In certain irregularities of continued fever, it may be adviſeable to employ it with a view of preventing the ſubſequent attacks of the diſeaſe, or in ſmaller doſes, ſo as to ſupport the ſtrength of the patient, but theſe conſi-derations will be the ſubject of a future diſ-ſertation.

The author has now enumerated the ſe-veral claſſes of medicines which have been employed to terminate a fever ſooner than it would be terminated in its ordinary pro-greſs, or alleviate the diſeaſe, ſo that it ſhall go through its progreſs with leſs danger to the patient, by rendering the ſymptoms leſs violent, excepting ſome few which he hardly thinks worthy of notice. Small doſes of ceruſſa acetata were employed by Gaubius, and other medicines have been recommended by other phyſicians, which have never, as far as the author

knows, come into general practice in any country, or have been uſeful.

The author has now pointed out the appearances which take place at the beginning of a continued fever, ſhewn thoſe that take place during the courſe of the diſeaſe, at what time, and how they take place, and how they continue until the diſeaſe deſtroys the patient, goes off by criſis, or wears itſelf gradually out. He has alſo endeavoured to point out what attentions are to be paid to the patient on leaving the diſeaſe to purſue its ordinary courſe. He has alſo endeavoured to ſhew thoſe means which have been employed to ſhorten the diſeaſe, ſo as to reſtore the patient to his priſtine health, without leaving it to terminate itſelf by a criſis, or wear itſelf out.

One thing, however, is ſtill left. The author has ſaid, that in a regular continued fever there is always depreſſion of ſtrength, and that depreſſion of ſtrength ſometimes riſes to ſuch a degree as to occaſion putrefaction of the fluids. This is certainly not the caſe in the greateſt number of regular continued

nued fevers, and does not happen perhaps once in an hundred cafes of the difeafe in all its forms and varieties. The author, however, could not pafs over this fymptom in defcribing regular continued fever, becaufe, according to his opinion, this appearance of putrefaction always depends upon depreffion of ftrength; he therefore has defcribed the appearance of putrefaction, and fhewn that if it did take place, it endangered the life of the patient in the manner which has already been pointed out.

As therefore fymptoms of putrefaction have been defcribed as taking place from depreffion of ftrength, a conftant part of fever, and when this depreffion of ftrength takes place in fuch a degree as to produce putrefaction of the fluids, the putrefaction endangers the life of the patient, it is neceffary to enquire what means may be employed to prevent or remove this fymptom, or counteract it fo as to preferve the life of the patient.

All animal folids and fluids, which are employed for any of the purpofes of life,

consist of a solid substance combined with water. This solid substance the author has called by the generic term of animal mucilage; and this acceptation of the term mucilage has now, at least in this country, Great Britain, been almost generally adopted.

There are fluids contained in animals, which have either no mucilage in them, or such a small quantity, as to be in no proportion worth attending to, not in the quantity of an hundredth part of the whole. These, however, are all excrementitious fluids which are no longer useful, and which are in their way to be evacuated.

The mucilages which form the solids and fluids along with water, which are employed in the living body, have various properties.

Some combine with water so as to form solids, such as the mucilage of the membranes, fibres, and cartilages of the body; some combine with water so as to form fluids, such as the mucilage of the serum,

coagulable lymph, bile, &c.; ſome are perfectly colourleſs, inſipid, and inodorous, ſuch as the true ſkin, the ſerum, &c.; ſome are coloured, ſuch as the mucilage of the bile, which is yellow, and the mucilage of the red particles of the blood, which is red; ſome have a taſte, as the mucilage of the bile has a bitter taſte. All theſe properties remain perfect while the different mucilages are performing their offices in a living body.

If any of theſe mucilages be taken out of the living body of an animal, and allowed to die inſtead of retaining the properties that they had while in the body and alive, in a ſhort time theſe properties are by degrees altered and loſt, and the matter of theſe mucilages acquires new properties totally different from thoſe that they had during the time that they formed a part of the living body.

When either a ſolid or a fluid is taken out of a living body, there are ſeveral circumſtances to which it is expoſed which are different from thoſe from which it was in when

when it was in the body of a living animal, besides that it can no longer now be considered as alive. It may then be owing to some of these circumstances in which the animal mucilage is placed, when out of the living body, independent of its losing its life, that such change in its properties may arise. It is therefore to be enquired, whether these changes which take place in the properties of an animal mucilage, when taken out of the body and deprived of life, arise from its being merely deprived of life, or from the other new circumstances into which it is put.

Certain animal mucilages, on being deprived of life, lose many of their properties which they had when they were alive, as soon as the life ceases in them. All the solid parts of an animal which are capable of contracting, so as to become shorter than they would be if they were not alive, are constantly contracted to a greater degree when alive, than they would contract from their elasticity. This contraction ceases when they are dead; they are always, therefore, longer in a dead body than in a living body, even when they retain all their chemical

mical properties; (that is to ſay, the properties that diſtinguiſh them from any other ſpecies of matter) as well as their mechanical properties. This propoſition admits, however, of ſome abatement; a ſolid, capable of contraction when an animal is alive, and exerting that power of contraction ſo as to become ſhorter, requires a greater force to break it, than if it was not to exert its power of contraction; for it contracts by its particles coming nearer one another in the direction in which it contracts, but it breaks by its particles going to a greater diſtance from each other in the ſame direction; but particles cannot come nearer each other in one direction, and go to a greater diſtance from each other in the ſame direction in the ſame inſtant of time; therefore the power which the particles exert in coming nearer each other, in conſequence of being alive, will reſiſt any power which endeavours to draw them to a diſtance from each other whatever it may be, or in other words, a living moving part, by its conſtant contraction depending upon life, will reſiſt any mechanical power which attempts to break it.

As thus the mechanical properties of a living ſolid differ in ſome reſpects from thoſe of the ſame ſolid immediately upon its death, ſo likewiſe the chemical properties of living ſolids or fluids, conſidered as alive, or as acted upon by the living ſolids contained in them, differ from the chemical properties that they have immediately upon their death. If a certain quantity of kali purum, a ſcruple for inſtance, be applied to any living ſolid in the body, it will unite with a certain quantity of the mucilage of the ſolids, and form a ſaponaceous ſubſtance, perhaps half a dram; if the ſame quantity of pure kali be applied to the ſame ſolid juſt when it has loſt its life, it will unite with a much larger quantity, perhaps a drachm; it will therefore combine with a larger quantity in the dead than in the living body.

The mucilage of the coagulable lymph, contained in the blood-veſſels, is either alive itſelf when ſo contained, or acted upon by the living blood-veſſels, and is in conſequence perfectly ſoluble in water; if it be

extravaſated

extravaſated into any cavity of the body, or if it be thrown from the blood-veſſels out of the body, although in all other ſenſible circumſtances it be in the ſame ſituation as it was in when it was contained in the blood-veſſels, it becomes inſoluble in water, ſeparates from the water in which it was before diſſolved and becomes ſolid, or, according to the ordinary term, coagulates.

It is not therefore ſtrictly true, that the ſolids and fluids of a living body retain exactly the mechanical and chemical properties which they had when alive the inſtant they die. There are ſome proceſſes which do not go on in animal mucilages when alive, in whatever circumſtances they are, which go on under the ſame chemical circumſtances when the ſame animal mucilage is dead.

When an animal mucilage is alive, it continues fluid or ſoluble in water, or not ſoluble in water, ſo as to form a fluid or a ſolid with the water with which it is combined, of an equal degree of ſoftneſs or firmneſs if it be a ſolid, and with an equal

degree

degree of adhesiveness or limpidness. If it be a fluid; it continues of the same colour, taste and smell. The moment that it dies, it loses those mechanical and chemical properties; a mucilage, therefore, is not acted upon by the same mechanical and chemical laws when alive, as when it is dead.

As soon as an animal mucilage dies, it becomes subject to various chemical changes, when put under certain circumstances, to which it was not subject when alive. One of these processes is known by the name of putrefaction. If a dead animal mucilage combined with water, so as to form a flexible solid, is placed in a heat between 45 and 150 degrees of Fahrenheit's thermometer, putrefaction begins to take place; this happens most readily in a heat of about an hundred degrees, if the mass be moderately exposed to the air of the atmosphere, and particularly that part of it which is called pure or respirable air.

The appearances which take place in a dead solid under these circumstances are, that the

the whole of it loſes its firmneſs, that is, it is pulled to pieces with leſs external force; it feels more clammy to the touch, and if it be waſhed with water heated to about fifty or ſixty degrees, a part of it diſſolves in that water.

If it be the red particles of the blood, they become of a darker red colour after ſtanding for ſome time, and upon examining them with a microſcope, ſome of them appear broke into two, and look like half moons, and ſometimes into ſeveral pieces like other ſections of a ſphere, and ſome appear ſtill ſpherical, but of leſs diameter, and by degrees diſſolve in the ſerum, giving it a reddiſh colour. They likewiſe redden the mucilage of the coagulable lymph. If the coagulable lymph be extravaſated, or remains in the large veſſels of animals after they are dead, it coagulates into a very firm ſubſtance, which by putrefaction becomes eaſier to break down, has a clammy feel, and part of it is rendered ſoluble in water, ſo as to form a fluid. The mucilage of the ſerum which, when it is taken out of the living

living body coagulates, if heated to one hundred and ſixty-five degrees, into a firm ſolid maſs, when it undergoes this proceſs, if heated to that degree, it coagulates into a looſer maſs, and ſome of it not at all. Similar changes take place in the other mucilages of the body when putrefaction juſt begins.

In like manner, the other fluids of the body loſe the properties which they had before putrefaction began.

If the putrefaction continues, the changes which take place do not happen in the whole matter which is to putrify at once. In the firſt ſtage, the whole of a ſolid fibre does not at once become ſoluble in water, ſo as to form a fluid, but part of it becomes ſoluble in water, and the other part remains without changing its properties in the leaſt. In like manner, the whole of the red particles of the blood are not broke down into ſmaller particles, but ſome of them remain quite perfect, and have that form they had when taken from the animal in perfect health,

whatever

whatever that form may be, for their form has been difputed, and has not been agreed upon; in like manner part of the coagulable lymph coagulates perfectly, and another part of it does not coagulate upon extravafation. The ferum likewife, in part, coagulates by heat as firmly as if no change has taken place in it, while another part does not coagulate at all. The mixture of the folid fibres, which are become foluble in water, with that part of them which has not changed fo as to become foluble in water, being perfectly uniform, gives foftnefs to the whole mafs. Thus a portion of all thefe fubftances putrify at the beginning of the procefs, and another portion remains as perfect as it was before.

What has been above obferved, is fimilar to what happens in all fermentations.

When a fermentation begins to take place, it does not take place in the whole mafs at once, but in a certain part of it only, in which part a change inftantly takes place; while in the other parts, no change whatever has

 happened.

happened. For example; if we have an hundred of the ſmalleſt integral parts of ſugar diſſolved in water, and place them in circumſtances in which the vinous fermentation ariſes, at the firſt inſtant of the fermentation one of the particles of ſugar is converted into wine, and the other ninety-nine particles remain ſugar the ſame as before any fermentation took place; or, in the firſt inſtant of the fermentation, two or more of the particles of ſugar may be converted into wine, while the remaining particles of ſugar continue the ſame ſugar they were before.

Suppoſing that the firſt of theſe ſuppoſitions ſhould be the caſe, in the ſecond inſtant of the fermentation, two of the particles of ſugar will be converted into wine, and ninety-eight will remain perfectly in the form of ſugar, and ſo by degrees the whole ſugar will be converted into wine when the fermentation is finiſhed, but during the progreſs of it there will be a certain quantity of ſugar, and another quantity of pure wine.

This is proved by taking the mafs of mixture of fugar and wine, at any time during the progrefs of fermentation, diftilling it until the whole alcohol is carried over. Afterwards feparate the alcohol from the water fo as to render it pure, and meafure or weigh it. To the liquor remaining in the ftill, add a little quicklime, and mix a portion of whites of eggs; then expofe the mafs to a degree of heat fufficient to coagulate the whites of eggs; throw the whole through a filter; evaporate and cryftallize; the fugar in it will be found the fame fugar that was fubjected to the fermentation, and its quantity will be in the inverfe proportion of the alcohol obtained. If there be half the fugar, there will be a certain quantity of alcohol; if there be a quarter of the fugar, there will be half as much more of alcohol, as is well known to thofe who form vinous liquors for diftillation.

It might happen that the whole of the mucilage which, with the water, conftitutes

the coagulable lymph, might by putrefaction at once become ſoluble in water, ſo as to make a fluid ſolution; that the whole red particles of the blood might become ſoluble in the ſerum, ſo as to form a dark reddiſh fluid; that the whole of the mucilage of the ſerum might loſe the property of becoming ſolid when expoſed to a heat of an hundred and ſeventy degrees of Fahrenheit's thermometer, and yet no further change ſhould take place.

It might happen in like manner, that the other mucilages of the body might only loſe the properties that depended upon their ſolubility in water, and ſtill retain their other qualities.

This, however, does not take place, if any dead ſubſtances continue to be expoſed to the circumſtances of putrefaction which have been enumerated, whether they were colourleſs, or of whatever colour they were in the healthy living body, they gradually aſſume a brown colour, which increaſes until

until it becomes of a ſhade ſo deep as to be conceived to be black.

In the progreſs of this proceſs, ſubſtances begin to be extricated, which are vapours in the heat and preſſure of the atmoſphere.

One of theſe vapours has a fetid ſmell, very ſimilar to the ſmell of a compound of inflammable air and ſulphur. This ſmell has commonly been called a putrid ſmell, but experiments have not been made to determine whether it be actually a compound of inflammable air and ſulphur or not, as far as has come to the knowledge of the author.

Another vapour extricated in this proceſs is gas, whoſe ſynomims have been already pointed out, viz. fixed air and carbonic acid; another vapour is pure inflammable air, which does not appear till the end of the proceſs.

 The

The mucilages are partly converted into theſe vapours, but at laſt there begins alſo to be found in the maſs, if examined, nitrous acid and muriatic acid, combined with lime and ammonia, and towards the end of the proceſs calcareous earth and ammonia, combined with gas.

All theſe things have been aſcertained by experiment; it has been conjectured that clay is alſo produced.

Although the mucilages undergo theſe changes in the body of a dead animal, when kept in the ſame chemical circumſtances in which they were in the body of a living animal, yet there are certain means of preventing them from going through the putrefactive fermentation after the death of the animal. In the firſt place, no ſuch change will happen, if they be placed in ſuch a degree of heat as will freeze the water contained in them; ſecondly, this change will not happen in the heat of two hundred and twelve degrees, or even in a heat ſomewhat below that degree, though that

degree

degree of heat in which putrefaction will not take place from the heat being too great, has not been exactly aſcertained. In the third place, if no pure air whatever touches ſuch animal mucilage, no putrefaction will occur in them. In the fourth place, although air ſhould touch it, if a certain preſſure is made upon it by condenſing the vapours ſurrounding it to a very great degree, putrefaction will ariſe much more ſlowly, though it is not aſcertained that there is a degree of preſſure which will prevent putrefaction from ariſing altogether. Fifthly, if the whole water be ſeparated from the mucilage by evaporation, no putrefaction will take place in it. Sixthly, if the water be ſeparated from an animal mucilage by its coagulating in conſequence loſing its life, or if it be coagulated by heat, or by certain ſubſtances applied to it which have this effect, and if the water be afterwards ſqueezed out from it; when in any of theſe ways mucilage is ſeparated from water, and rendered inſoluble in water again, the more perfectly it is ſeparated from the water with which it was

combined, and the more perfectly it is rendered insoluble in water, the more difficultly the putrefaction will happen; and, if it be perfectly separated from the water, no putrefaction will take place. Seventhly, although a dead animal mucilage be kept in a heat in which it would putrify most readily, which is nearly that of the human body; if it be exposed to a proper quantity of pure air for putrefaction, as it is also in the human body; if the air in which it is contained is neither too rare or too dense to allow putrefaction to take place properly, as it is not in the human body; if it has a proper quantity of water contained in it; and if its water be not separated by evaporation or by tanning, neither of which happen in the human body without killing the part; if it should be in all these circumstances in which putrefaction takes place most readily in dead matter, yet if such animal mucilage should be kept immersed in an acid of any kind, or in an alkali, or in a metallic salt, or in gas, or in several other substances, it will not putrify. It is to be observed, however, that the quantity of these substances which

are

are applied to it, to prevent it from putrifying under theſe circumſtances, muſt bear a certain proportion to the whole of the mucilage, otherwiſe they will have no ſuch effect. Let a drop of vitriolic acid be applied to an hundred weight of animal mucilage, and equally applied to all of it, putrefaction would certainly not be prevented. There muſt be then an adequate proportion of ſuch antifermentative antiputreſcent to produce any ſenſible effect; certainly ſixty grains of concentrated vitriolic acid would have no effect on an hundred pounds of animal mucilage, whether ſolid or fluid.

Suppoſing then we could apply ſixty grains of vitriolic acid to the human body, which commonly weighs one hundred and fifty pounds, in which all theſe circumſtances of putrefaction are found, we could not expect any ſenſible effect to ariſe from it, whether the body be living or dead, and the ſame thing may be ſaid of all antiputreſcent ſubſtances.

But

But fixty grains of concentrated vitriolic acid can never be applied to the living human body, excepting it be to the furface of the fkin, or rather the fcarf-fkin; for five grains of concentrated vitriolic acid, and that diluted with water, are as much as can be thrown into the ftomach at once, and this cannot be repeated more than fix times in the twenty-four hours. The acid fo thrown in will be deftroyed by the bile and otherwife, and alfo be evacuated, fo that we cannot expect thirty grains to exift in the blood-veffels at once, and certainly we can never get fuch a quantity into them as to be fenfible to any experiment; we cannot therefore apply vitriolic acid, fo as to prevent putrefaction in any perceptible degree. The fame reafoning may be applied to any other antifermentative antiputrefcent, fuch as any other acid, alkali, neutral falt, &c.

Vitriolic acid is among the moft powerful fubftances for preventing putrefaction in proportion to its quantity. Peruvian bark is alfo capable of preventing putrefaction in dead animal matter, placed in circumftances

cumſtances in which it would putrify, if the Peruvian bark was not applied to it. But while five drops of vitriolic acid may prevent a pound of dead animal matter from putrifying in a ſenſible degree, in circumſtances in which it would otherwiſe putrify, it will require five hundred grains of Peruvian bark to have the ſame effect upon a pound of dead animal matter; now ſuppoſe that Peruvian bark gets into the blood-veſſels, which is a queſtion, it certainly never could get in in ſuch a quantity as to produce a ſenſible effect on an hundred and fifty pounds of animal matter; therefore, taking it in this light, we could not expect to get into the blood-veſſels ſuch a quantity of any antifermentative antiputreſcent, as to prevent the animal body from putrifying, if it were not prevented by the effects of life.

Since the mucilages of the body of a living man are in all the circumſtances moſt proper for putrefaction, *i. e.* they are in the moſt proper heat, are expoſed to be acted upon by a moderate quantity of pure air, are

are combined with a proper quantity of water, are in motion, remain often without change during a time they would putrify in, if they were in the ſame circumſtances in a dead body, and have nothing in them which prevents them from putrifying when dead, it muſt be concluded that the life only prevents them from putrifying, or in other words, that it is as much a property of living matter not to putrify, as it is of dead matter to putrify. Since then nothing can be applied in ſuch proportion to them as would prevent them from putrifying if dead, ſo nothing can be applied in ſuch proportion as can prevent them from putrifying when alive.

Taking the argument in another view, it may be true that ſuch a quantity of vitriolic acid, or any other antiputreſcent antifermentative may not be able to get into the body, as to check putrefaction, yet the living power of the body, although diminiſhed, would in ſome degree ſtill prevent putrefaction from taking place. Antifermentative antiputreſcents might ſup-

ply the loſs of the living power, ſo that the remaining power of the life, together with the antiputreſcent power of the antifermentative, might be ſufficient to prevent any putrefaction. The very ſmall quantity of the antifermentative that can be applied in proportion to the maſs of matter that it has to work upon, makes it extremely improbable that it would, even taking the argument in this view, at all retard putrefaction.

A certain degree of putrefaction of the fluids, in a living and otherwiſe healthy body, may be brought on by a perſon's eating ſalted animal food with farinaceous matter. This degree of putrefaction is a diſeaſe which has been called ſea ſcurvy, although it happens equally at ſea or on ſhore, when ſuch food is made the only nouriſhment. In this caſe, depreſſion of ſtrength is the firſt ſymptom of the diſeaſe, which ariſes evidently from food diſpoſed to putrify, for if the patient lives on food not diſpoſed to putrify for two or three weeks, the depreſſion of ſtrength, the ap-

pearances

pearances of putrefaction, and the whole difeafe are carried off.

In this cafe, neither vitriolic acid, nor Peruvian bark, nor any other antifermentative antiputrefcent, has any effect in taking off the putrefaction, though they can be applied to the food in the ftomach, and can therefore act upon it in a much larger proportion than they can do on any of the other folids or fluids of the body.

It is only native vegetable acid, and the loofer vegetable fubftances, which we commonly call greens, which are capable of being digefted themfelves, and in their digeftion rather tend to become acid than to putrify, that carry off the depreffion of ftrength, the appearances of putrefaction, and the whole difeafe.

When putrefaction of the fluids therefore arifes folely from the depreffion of the powers of the body from ufing improper food, antifermentative antiputrefcents have no power of the preventing putrefaction.

We

We can therefore have little expectation of their preventing putrefaction arifing from depreffion of ftrength taking place in fever; neither are vitriolic acid, Peruvian bark, &c. found actually to prevent putrefaction, when it arifes from the depreffion of ftrength in a violent fever.

Moreover it has been conceived, that not only putrefaction might be prevented when it arofe in the folids and fluids of the body, but likewife that the parts that had already undergone putrefaction to a certain degree, might be made to return again to that found ftate from which they became putrid.

If animal folids putrify, the firft appearances are, that they acquire an adhefivenefs to other fubftances greater than they had before; they become of a greenifh or brownifh colour, and emit a fetid vapour, and are more foft and flabby. If they be taken in this ftate, and diluted vitriolic acid be applied to them, they lofe their adhefivenefs, become firmer, nearer their colour when

found,

found, and lose their smell. It has been thought in this case, that not only farther putrefaction was prevented, but that the part was re-changed, and brought back to the state it was in before the putrefaction began to take place.

On considering the argument, however, this by no means appears to happen. An acid decomposes the fetid vapour, so as to take off its fetor, but it does not re-convert the fetid vapour into the solid from whence it was produced; for if the fetid vapour be collected together after it is separated from the other parts, and an acid is applied to it, no animal solid is produced, though the smell of the fetid vapour is entirely lost.

That the destruction of the fetid vapour is a different process from the solids re-acquiring its firmness, is evident, because the solids may re-acquire their firmness without the fetor's being diminished, by applying an infusion of oak-bark to the matter that is become soft by putrefaction.

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The action of the infusion of oak bark is in this case upon the part that has not been changed by the putrefaction; that part it coagulates as it always would have done; but upon that part which has already been changed by the putrefaction, it has no effect.

For not only fermentation, but also solution and other chemical processes, do not take place in every particle of the mass that is acted upon, at the same instant, but progressively; that is, first upon one part of the mass, in that part the properties are totally changed; the properties of the remaining part continuing perfectly the same.

Thus, if a piece of lime be thrown into a vessel containing muriatic acid, as soon as it is thrown in, a part of the muriatic acid combines with a part of the lime, and forms a compound, viz. calx muriata, whose properties are perfectly different from the properties of the muriatic acid, or the properties of the lime, the remaining muriatic acid and the remaining lime retaining each its own

properties, ſuch as they were before they were thrown into the ſame veſſel; there are therefore, after the firſt inſtant of the operation in the whole maſs, lime, muriatic acid, and calx muriata.

Again, ſuppoſe ferrum vitriolatum, a compound of calx of iron and vitriolic acid, be put into a retort, and a receiver be adapted to it, and the retort be heated to a certain degree, the heat ſeparates the vitriolic acid from the calx of iron, but not at once: at the beginning of the operation, a part of the vitriolic acid diſtills over, a part of the calx of iron remains behind in the retort, and along with it a part of the ferrum vitriolatum, not decompoſed, but retaining the ſame properties it had before the operation.

So if a muſcular fibre be placed in the circumſtances in which it putrifies, the whole does not putrify at once, part putrifies, and is converted into a mucilage ſoluble in water, and not coagulable; and if the putrefaction go further into fetid vapour,

&c. a part alſo remains coagulable by oak bark. Thus the oak bark renders the part that was unchanged much firmer by coagulating it, but is far from reſtoring the whole maſs to what it was before. The coagulated or tanned part has not now the properties the muſcular fibre had before it began to putrify, but is a ſubſtance with its properties totally different, excepting in its firmneſs; the fetid vapours, and other vapours remaining the ſame as if no oak bark had been applied.

In the caſes, therefore, where oak bark, or any ſuch ſubſtances have been applied to give firmneſs to animal ſubſtances which have become ſoft by putrefaction, that firmneſs ariſes from the coagulation of the parts yet unchanged by the putrefaction, and not from the parts, which have gone through any ſtage of putrefaction, returning to their former ſtate ſo as to have their former properties, and ſo as to be uſeful for the purpoſes which they ſerved in the body before the putrefaction had taken place.

When an acid or any other ſuch ſubſtance coagulates, and renders firm a maſs which is already putrified in part, it does not reſtore it to its former ſtate. When it combines with or decompoſes the fetid vapours, it does not unite with them ſo as to produce the ſubſtances that were changed into ſuch fetid vapours by putrefaction, nor does it ſeparate theſe ſubſtances from the putrid vapours ſo as to reſtore them to their priſtine ſtate.

Neither coagulating ſubſtances, therefore, nor ſubſtances deſtroying fetid vapours, reſtore putrid ſubſtances to what they were before.

Upon the whole, therefore, no expectation can be had of applying ſubſtances in fevers, where there is diſpoſition to putrefaction, from putrifying, by any remedy that will either produce in them, or prevent any chemical proceſs; much leſs can there be any expectation of reſtoring them to their former ſtate, when they have actually putrified, by any ſuch remedy.

The

The only means, therefore, of preventing putrefaction in fever are: first, the carrying off the fever by the means already pointed out. When, therefore, symptoms of great depression of strength, such as great loss of muscular power, great oppression about the præcordia, sighing, a feel of softness in the pulse, &c. arise at the very beginning of a fever, a practitioner should be more anxious to produce a crisis by antimonial preparations, &c. Secondly, the avoiding all applications which diminish the force or depress the strength of the system. Evacuations therefore that are unnecessary, as bleeding, &c. should be carefully avoided, the patient should be kept quiet in bed, his mind as much at ease as possible, &c.

If any of the parts of the body have already putrified, the only way by which the putrid matter can be got rid of, is to suffer it to pass through the excretories of the body.

If with strong symptoms of putrefaction of the fluids, an hæmorrhage should take

 place

place either from the noſtrils or mouth, or if blood be vomited up, or if it comes from the lungs, or if purging of blood ſhould take place, or an hæmorrhage ſhould happen from the womb, or if blood comes along with the urine, even if the hæmorrhage ſhould be in ſmall quantities, the patient is in the utmoſt danger. Should effuſion of blood take place in any of theſe ways, without attending to any thing elſe, every means ſhould be attempted to ſtop ſuch hæmorrhage. The moſt powerful remedy for ſtopping hæmorrhage ariſing from laxity or putrefaction, is the bark of the cinchona, which ſhould be given in powder to the quantity of an ounce in twenty-four hours, together with acids and other aſtringents. The following form, or ſomething ſimilar, may be exhibited:

R. Decoctum corticis cinchonæ libras duas cum ſemiſſe;

Roſæ rubræ exſiccatæ unciam dimidiam;
Acidi vitriolici diluti drachmas quinque.

Decoctum fervens roſæ affunde in vaſe vitreo, dein adde acidum vitriolicum dilu-

tum,

tum et macera, per horam dimidiam. Liquorem frigefactum cola.

R. Colaturæ uncias duas;

Pulveris corticis cinchonæ drachmam unam; misce fiat haustus quarta quaqua hora sumendus.

Although when hæmorrhage arises in consequence of putrefaction, all other considerations must give way to so dangerous an accident; other hæmorrhages are not to alter our other attentions during the fever. Sometimes an active hæmorrhage from the nostrils, or another part, carries off the fever in the same manner as an inflammation, although the hæmorrhage be but in a small quantity. If a large hæmorrhage should arise without symptoms of putrefaction, whether it relieves the fever or not, it may be prudent to check it by infusion of roses, prepared according to the London Pharmacopœia, given to the quantity of two ounces every four hours; but the bark of the cinchona is not to be exhibited, unless it be proper from other views in the disease.

The author comes now therefore to treat of the care of patients in a convalefcent ftate, after a regular continued fever.

If a crifis fhould arife at the beginning of the firft week of a regular continued fever, or before the fixth day, the difeafe moft commonly returns, and becomes an intermittent.

The author muft again take notice of the fuppofition, that there is fome matter to be altered in the progrefs of a fever before it can be expelled from the fyftem, which he has fhewn is only fuppofition, and is unfupported by any experiment, no man having ever feen, fmelt, or tafted fuch matter; it has however been often inculcated, that fuch matter muft be fubdued by allowing the intermittent to go on.

If however a crifis fhould take place in the firft week of a regular continued fever, and if the crifis fhould be perfect or nearly fo, if there fhould be confiderable fweating, if the tongue fhould be clean or nearly fo,

if there ſhould be a lateritious ſediment in the urine, if the coſtiveneſs ſhould be gone off, if the head-ach ſhould have ceaſed altogether, or nearly, if the pulſe ſhould be leſs than eighty ſtrokes in a minute, and tolerably free, the author is warranted from experience to ſay, that the bark of the cinchona ſhould be given in powder immediately after the criſis, which is commonly about ſix or ſeven o'clock in the morning, to the quantity of a drachm every hour, and continued at leaſt for forty-eight hours.

By this practice, it often happens that a return of any paroxyſm is prevented, and the patient is freed from the diſeaſe.

If the criſis has ariſen without the exhibition of any medicine, as the author has ſuppoſed in what is ſaid above; if the criſis has been nearly complete, and the bark of the cinchona has been employed as has been repreſented, and notwithſtanding this a freſh paroxyſm of fever ſhould return, the caſe muſt be referred to what has been ſaid in

treating of regular tertian intermittents, or will be ſaid in treating of irregular intermittents in a future diſſertation.

Suppoſing that preparations of antimony, ipecacuanha, or any other medicine which has the property of producing ſymptoms ſimilar to thoſe which ariſe in the ordinary criſis of a regular continued fever have been exhibited, and that they have actually produced theſe appearances which take place in ſuch criſis, and there is a freedom from the ſymptoms of fever equal to that which has already been deſcribed, in this caſe the bark of the cinchona ſhould alſo be employed as has been deſcribed.

Suppoſing that in the beginning of a regular continued fever there ſhould be much greater pain in the forehead, or over the whole head externally, and that either by applying leeches to the temples, or otherwiſe making topical evacuations from the head by bleeding, or if in a ſimilar caſe bliſters have been applied in the firſt days of a fever behind the ears, or otherwiſe to any part of the head, and the pain has ceaſed, and all

the other ſymptoms of the diſeaſe have gone off, although no miſchief would undoubtedly ariſe from employing the bark of the cinchona, yet as far as the author's obſervation goes, the fever has not returned, though it was not employed.

If in a continued fever no medicine has been employed, and a criſis ſhould take place in the firſt week of the diſeaſe, but that criſis ſhould be very incomplete; that is, though about four or five o'clock in the morning the patient ſhould fall into a ſweat, even rather profuſe, if there ſhould be a lateritious ſediment in the urine, but the head-ach ſhould not be much abated, if the tongue ſhould be ſtill foul, if the depreſſion of ſtrength ſhould remain very great, and the other appearances of fever ſhould ſtill remain without great abatement, it then becomes a queſtion, whether the bark of the cinchona ſhould be employed in large quantities, ſo as to try to prevent a return of a freſh paroxyſm of the fever.

This argument, in the author's opinion, depends on the following circumſtances:

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In the firſt place, this ſeldom happens in a regular continued fever in which the ſymptoms of the fever come on ſlightly at firſt. If it ſhould, as far as the author's experience goes, it is beſt to employ the bark of the cinchona in the manner deſcribed, for though it often fails in preventing the recurrence of a freſh paroxyſm of the diſeaſe, yet hardly any miſchief ariſes from it. There is in this caſe a chance of terminating the fever immediately, ſo that the patient ſhall recover his health, for which reaſon it had better be employed.

In the ſecond place, if a regular continued fever ſhould attack a patient at once with violent ſymptoms, great ſenſe of coldneſs followed by heat, returning alternately for twenty-four hours, or until the evening following, and if there ſhould be great head-ach, great depreſſion of ſtrength, anxiety, &c. and no medicine has been exhibited which produces appearances ſimilar to the ordinary criſis of fever; if an imperfect criſis ſhould happen in the firſt week of the diſeaſe; in this caſe neither the bark of the

the cinchona, nor any other medicine acting in the ſame manner ſhould be employed. If this ſhould happen, it is proper to employ preparations of antimony, or other medicines of ſimilar effect, in the manner that has been already deſcribed; when it is wiſhed that they ſhould exert their effects in the moſt powerful manner to carry off the remaining ſymptoms of the diſeaſe.

When the bark of the cinchona has been exhibited, ſometimes no freſh attack of the fever has taken place, and the remaining ſymptoms of the firſt ſtage have gradually diſappeared; but much more frequently the diſeaſe has returned, and continued as if no ſuch imperfect criſis had happened, and the whole fever has been more ſevere, or the appearances which have remained have continued and gradually increaſed, and formed a new fever, which has lingered out for ſeveral weeks; or laſtly the patient has been relieved from the fever, but continued in a languid and morbid ſtate for a great length of time.

This

This obſervation is one of the grounds on which the author has formed his opinion, that the bark of the cinchona prevents the return of fever, but does not take off a fever which is preſent. Preparations of antimony and other remedies having the ſame effects exhibited in ſuch imperfect criſis in the firſt week of the diſeaſe, often remove the remaining appearances of fever, ſo that the patient is reſtored to health.

If, on exhibiting preparations of antimony or ipecacuanha, or any other medicine of the ſame claſs, a very imperfect criſis ſhould be produced in the ſecond week of a regular continued fever, the ſame method is to be purſued as if the criſis ſhould take place when no remedy has been employed.

If no medicine has been employed tending to produce a criſis in a regular continued fever, and a criſis has taken place in the ſecond week of the diſeaſe, if the criſis be tolerably perfect, that is, if a conſiderable ſweating ſhould take place in the morning,

if there ſhould be lateritious ſediment in the urine, if the tongue ſhould become tolerably clean, if ſome degree of head-ach ſhould even remain, and the pulſe ſhould remain frequent even to ninety or an hundred ſtrokes in a minute, and ſome other febrile ſymptoms ſhould ſtill continue, the bark of the cinchona ſhould be employed in as large doſes as the patient's ſtomach will bear. The fever is not near ſo apt to return, or be prolonged, as it is when ſuch a criſis takes place in the firſt week, and therefore it is better to employ the cinchona, or other medicines of that claſs, than preparations of antimony, or other medicines which have ſimilar effects.

The ſame thing is to be ſaid if a criſis has been produced in a regular continued fever by means of preparations of antimony, &c. in the ſecond week of the diſeaſe, or if the fever has been carried off in the ſecond week by any other means.

If a criſis ſhould take place on the fourteenth day, or any day afterwards, and the fever ſhould be diminiſhed by it, although not

not carried off, the appearances of the fever continue almoſt always to diminiſh until the diſeaſe goes off; it is therefore not neceſſary to employ any remedy with a view of preventing its return.

The great diſpoſition in a fever to return, if a criſis ſhould take place in the firſt week of the diſeaſe, the leſs diſpoſition which it has to return if a criſis ſhould take place in the ſecond week of the diſeaſe, and the very little diſpoſition which it has to return if a criſis takes place in the third week of the diſeaſe, moſt probably was the foundation of the idea which has prevailed from the earlieſt practitioners down to the preſent time, that there was ſome matter introduced into the body which required preparation or concoction; that is, that it ſhould be in ſome way altered, in order to be evacuated before a fever could be got rid of. When, however, it comes to be conſidered that this, though it be a poſſible explanation of this appearance, is by no means ſupported by any other evidence, the author therefore does not think it worth while diſcuſſing this

this argument. It would be neceſſary for him to write a great many volumes to refute the various opinions, which have been admitted into the theory of medicine as true becauſe they are poſſible.

If a criſis ſhould take place at any time of a fever, purgatives have often been employed with a view of evacuating any part of the matter which occaſioned the fever, that may have remained after the criſis had taken place. The author has already ſaid, that there is no reaſon for ſuppoſing any ſuch matter to exiſt; that it is mere hypotheſis; purgatives, therefore, cannot prevent a fever from returning, or any miſchief from happening by evacuating ſuch matter. A purgative has no power of carrying off one fluid out of the blood-veſſels more than another; it can only contribute, therefore, to the clearing the body of any particular ſubſtance, by occaſioning a quicker change in the whole fluids. Purgatives would indeed evacuate all thoſe which are at preſent in the body, ſo that a freſh ſet

of fluids would be formed more quickly. The ſerum, coagulable lymph, and red blood, and all the healthy fluids, would be ſooner re-produced from the food, if thoſe which are now in the body are evacuated by purgatives as well as noxious matter, but it would be long before the change would take place, and the noxious matter got rid of. Suppoſing there was mixed with the whole blood ſome extraneous matter, which amounted to an hundredth part of the whole, and ſuppoſing that one doſe of a purgative evacuated the hundredth part of the whole fluids, it would take more than fifty doſes of purgatives to evacuate the half of the extraneous matter, for no experiment has hitherto ſhewn, that purgatives has any ſpecific power of taking away one matter more than another.

It might be ſuppoſed that purgatives would evacuate the more fluid parts of the blood, and therefore would carry off the ſerum and ſuperfluous water. If this was the caſe, after purging every day for ſeve-

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ral days, upon opening a vein, and taking away a quantity of blood, there would be leſs ſerum and a larger proportion of coagulum. The contrary of this, however, is found to be the caſe; there is actually leſs coagulum, and more ſerum and ſuperfluous water.

It is commonly believed, when mercury has been exhibited, ſo as to produce ſalivation, that by exhibiting a purgative the mercury is carried off, and the ſalivation made to ceaſe. The author choſe forty patients as nearly ſimilar to each other as could be, who had been cured of ſyphilis by mercury, exhibited ſo as to produce ſalivation, and in conſequence the ſalivation was wiſhed to be carried off. To twenty of theſe he exhibited purgatives, and to the other twenty no medicine whatever; in this caſe the ſalivation ceaſed much ſooner, upon an average, in the twenty to whom no medicine whatever had been exhibited, than in the twenty who uſed purgatives.

It does not appear, therefore, that purging has any power of carrying off any nox-

ious matter remaining after a fever: firſt, becauſe there is no evidence of ſuch noxious matter exiſting; and ſecondly, if ſuch noxious matter did actually exiſt, there is no power in a purgative to carry it off.

Moreover, purgatives have a conſiderable tendency to re-produce the diſeaſe, or occaſion relapſes, as the author has ſeen in many inſtances, and there are alſo ſeveral inſtances on record, though not related with that view. For inſtance, De Haen relates a caſe, where he ſays, that a fever returned, though there was a perfect criſis about the end of the ſecond week, although purgatives had been exhibited; in that caſe, the purgatives evidently re-produced the fever. Purgatives are, therefore, never to be employed after the criſis of a fever, excepting there ſhould be coſtiveneſs, and in that caſe only ſo as to produce one evacuation.

If a criſis ſhould happen in the firſt or ſecond week of a fever, the patient is never ſo much reduced in his ſtrength as to require food of great nouriſhment. After ſuch a criſis, it is much better to confine him for

ſeveral

ſeveral days to ſuch food as he employed during the fever, eſpecially to avoid all ſolid animal food, more relapſes having been obſerved by the author to ariſe from uſing ſolid animal food too ſoon, than from any other cauſe.

If a criſis ſhould happen in the third week of a regular continued fever, although the patient be extremely weakened by the diſeaſe, yet no ſolid animal food is to be given; for it is to be obſerved, that the cauſe of the weakneſs, the exertions in the fever, have ceaſed. Very moderate nouriſhment in proportion to what mankind uſe commonly in cultivated countries, together with ſleep, which in this caſe is generally eaſy and refreſhing, is ſufficient to recruit his ſtrength. He ſhould therefore for many days refrain from ſolid animal food, the uſe of which, the author has already obſerved, he has found more productive of relapſes than any other cauſe whatever.

For the knowledge of the quantity of food which men uſe in civilized nations more than is neceſſary, the author begs leave to refer to his treatiſe on Digeſtion.

If

If the patient is to avoid ſolid animal food when a perfect criſis takes place in the third week, although he has been much exhauſted, it is much more to be avoided after a criſis has taken place in the firſt or ſecond week, when the patient is not only leſs exhauſted, but when there is likewiſe greater danger of a relapſe.

If no criſis ſhould take place in the firſt or ſecond week of a regular continued fever, and if in the third week the fever ſhould gradually diminiſh by critical ſymptoms taking place one after another; that is, if the tongue has been covered during the whole of the diſeaſe with a mucous cruſt, and that cruſt begins to leave the edges of the tongue, or exfoliates in ſmall pieces all over the tongue, or if the tongue has had a raw appearance when moiſt, and a glaſſy one when dry, if it begins to be covered with its ordinary mucus, and is putting on its common appearance, if the pain in the forehead is gradually ceaſing or entirely gone off, if there be a lateritious ſediment in the urine for a day or two, which afterwards ceaſes, if the ſkin becomes gradually moiſt,

or

or a ſlight ſweat ſhould ariſe about four or five o'clock in the morning, if the coſtiveneſs ſhould go off by degrees, or there ſhould be ſome laxity in the inteſtines, if the pulſe ſhould become ſlow, or if it ſhould fall at once to between eighty or ninety ſtrokes in a minute, if the ſkin ſhould return gradually to its ordinary colour, if theſe appearances of criſis ſhould appear after one another, or in a ſlighter degree at firſt, and gradually becomes more conſpicuous, the patient muſt be abſolutely forbid the uſe of ſolid animal food for many days after the fever has begun to ſubſide, or even of any food in too great a quantity, eſpecially at once.

If a criſis ſhould take place in the firſt or ſecond week of a continued fever, and ſhould be very perfect, the patient ſhould not be confined to bed during the whole twenty-four hours, but ſhould be covered with his ordinary clothing; but if the criſis be incomplete, and ſeveral of the ſymptoms of the firſt ſtage ſtill remain, it is better that he ſhould be confined to bed until theſe appearances go off.

If

If a complete crisis should take place in the third week of a regular continued fever, or if several critical symptoms should take place, it is better that the patient should be covered with his ordinary clothing, even supposing that he is obliged to lie upon the bed, excepting where the weakness is so very great, that he is apt to faint in being placed in an erect posture, or on any extraordinary exertion.

If the disease should begin gradually to diminish in the third week, when the diminution is become considerable, it is better also that the patient should be covered with his ordinary clothing during the day time.

The next dissertation will take notice of the irregularities and accidents which happen in intermitting and remitting fevers.

FINIS.